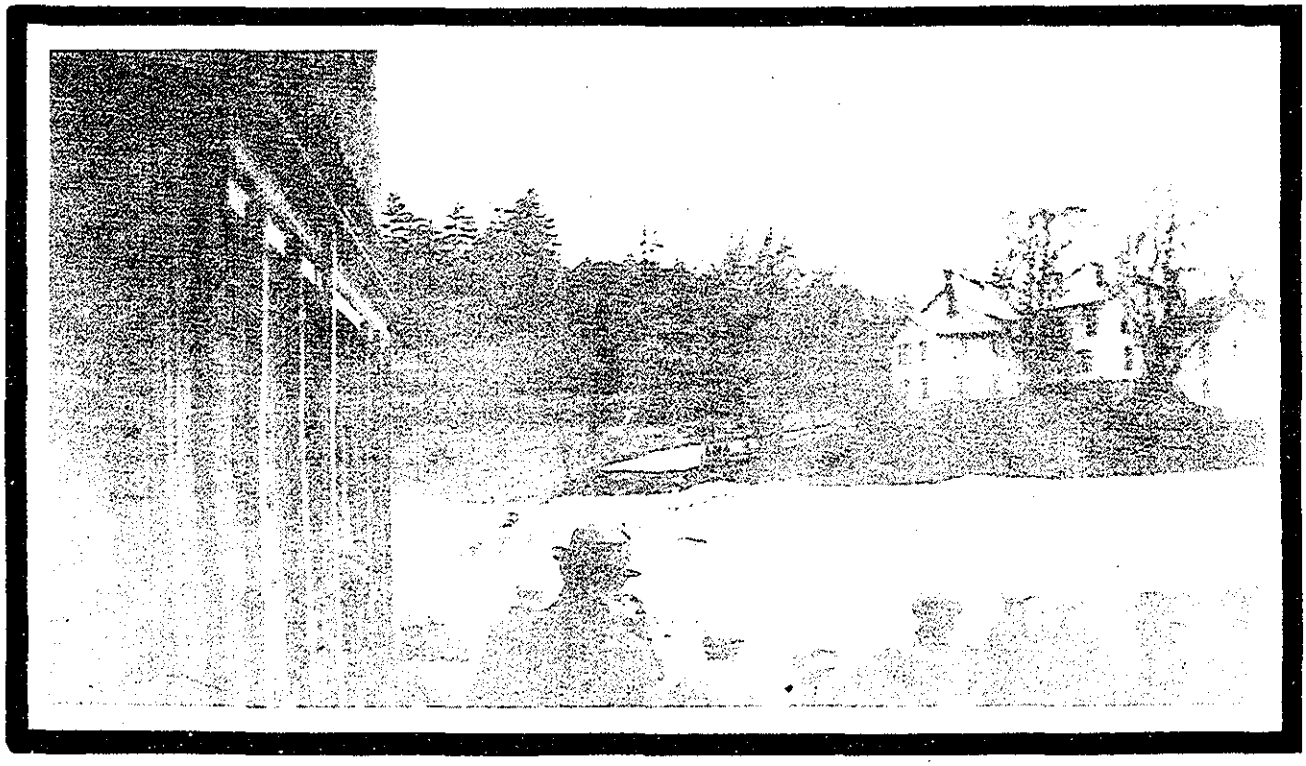
FLOOD PLAIN INFORMATION

LAMOILLE RIVER
COLCHESTER and MILTON, VERMONT



PREPARED FOR THE TOWNS OF COLCHESTER AND MILTON AND THE VILLAGE OF MILTON

BY THE DEPT. OF THE ARMY, NEW YORK DISTRICT, CORPS OF ENGINEERS, N.Y., N.Y.

FEBRUARY 1976

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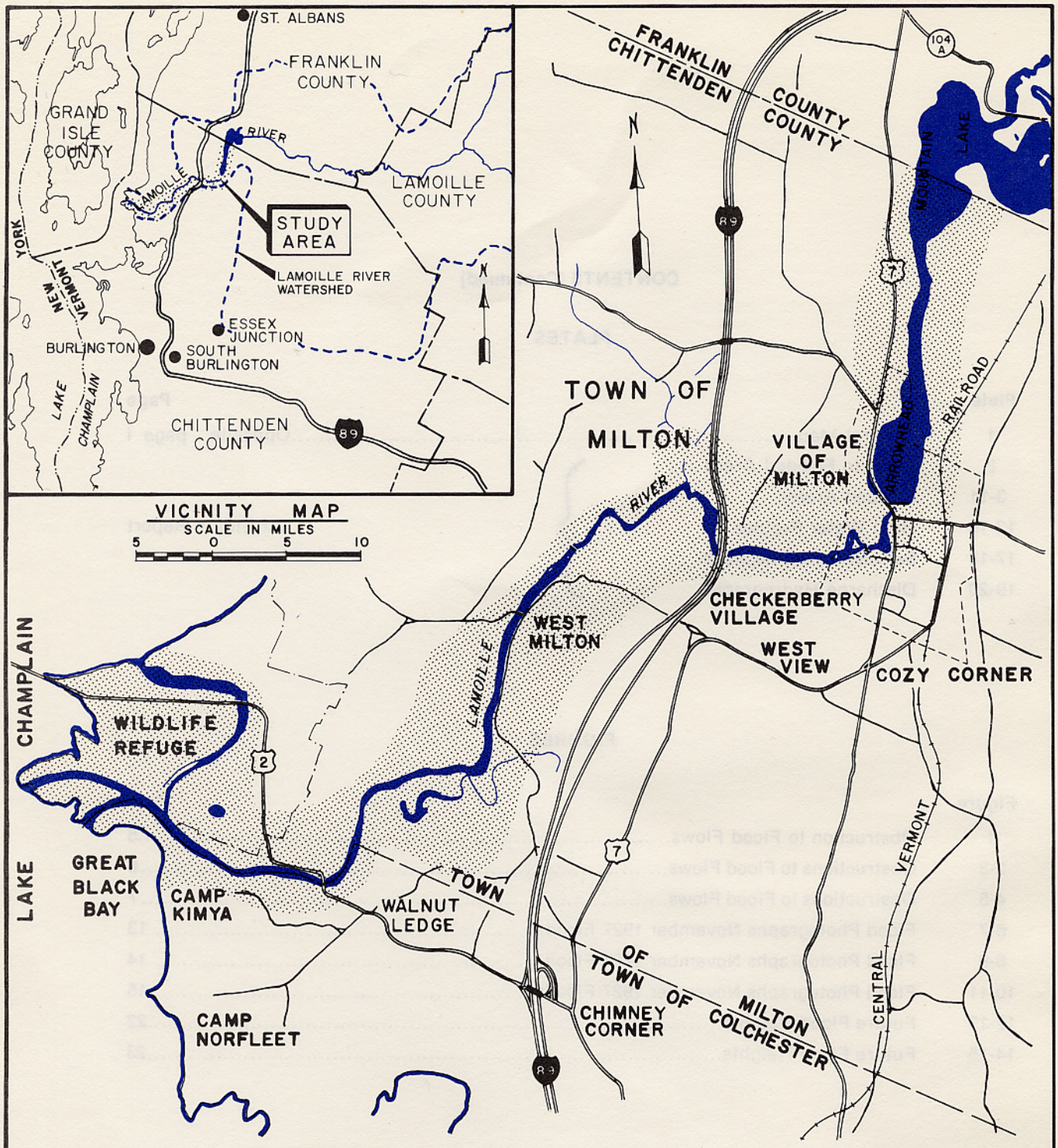

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- 7 — U.S. HIGHWAY
- 104 A — STATE HIGHWAY
- ---------- VILLAGE LIMITS
- —— —— —— TOWN LIMITS
- ——— — ——— COUNTY LINES
- ..... STUDY AREA

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
NEW YORK, NEW YORK

FLOOD PLAIN INFORMATION

TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON

VERMONT

GENERAL MAP

FEBRUARY 1976

PLATE I

PREFACE

The portions of the Towns of Colchester and Milton and the Village of Milton covered by this report are subject to flooding from the Lamoille River. The properties along this stream are primarily low density residential and agricultural and were severely damaged by the flood of November 1927. The open spaces in the flood plain which are now under pressure for development are limited. Although large floods have occurred in the past, studies indicate that even larger floods are possible.

This report has been prepared because a knowledge of flood potential and flood hazards is important in land use planning and for management decisions in the Towns of Colchester and Milton and the Village of Milton. It identifies those areas that are subject to possible future floods. Special emphasis is given to these floods through maps, photographs, profiles, and cross sections. The report does not provide solutions to flood problems; however, it does furnish a suitable basis for the adoption of land use controls to guide flood plain development and thereby prevent intensification of the loss problem. It will also aid in the identification of other flood damage reduction techniques such as works to modify flooding and adjustments including flood proofing which might be embodied in an overall flood plain management [FPM] program. Other FPM program studies--those of environmental attributes and the current and future land use role of the flood plain as part of its surroundings--would also profit from this information.

At the request of the Towns of Colchester and Milton and the Village of Milton and the endorsement of the Vermont Department of Water Resources, this report was prepared by DuBois & King, Inc., Engineering and Environmental Services, for the New York District of the U.S. Army Corps of Engineers, under continuing authority provided in Section 206 of the 1960 Flood Control Act, as amended.

Assistance and cooperation of the U.S. Geological Survey [U.S.G.S.], officials of the Towns of Colchester and Milton, the Village of Milton, State organizations, private firms, the Central Vermont Public Service Corporation, and private citizens in supplying useful data and photographs for the preparation of this report is appreciated.

Additional copies of this report can be obtained from the Towns of Colchester and Milton. The New York District of the U.S. Army Corps of Engineers, upon request, will provide technical assistance to planning agencies in the interpretation and use of the data presented as well as planning guidance in future assistance including the development of additional technical information.

BACKGROUND INFORMATION

Settlement

Town of Colchester

The Town of Colchester was chartered on June 7, 1763 to Edward Burling and 66 associates by Governor Benning Wentworth of New Hampshire. At the time of the charter, land situated in the area that today is Vermont was claimed by both New York and New Hampshire. In the fall of 1772, Ira Allen and his cousin, Remember Baker, took possession of Colchester by driving out a group of New Yorkers who were intent on surveying and settling the area. After exploring the area, Ira Allen brought his family to the area that is now Winooski and built a fort for protection against Indians and New Yorkers. Settlement of Colchester was interrupted by the Revolutionary War, but by 1786 a good part of the Town was settled. The early settlers built several sawmills and grist mills which became the Town's first industries. The occupation of the majority of the early settlers was farming.

During the nineteenth century, the main occupation of the Town was agriculture with the exception of Winooski, which had several industries. The industries included textiles, wood fabricating, and a machine tool firm. During this time, the population of Colchester increased from 2575 in 1850 to 5143 in 1890. In 1867, Winooski Falls became an incorporated Village. Colchester has continued to grow with the 1970 census showing a population of 7128 (Winooski excluded).

Town and Village of Milton

The Town of Milton was chartered on June 8, 1763 by a grant of 23,040 acres to 62 grantees by Governor Benning Wentworth of New Hampshire. Although the area now known as Vermont was claimed by both New Hampshire and New York, the persistence of the settlers under the New Hampshire grant resulted in the birth of the State of Vermont in 1777.

The Town was not settled until after the Revolution. The early settlers were attracted because of the fertile land and abundant water power available. The increasing density of settlement near "Great Falls" resulted in the incorporation of the Village of Milton. The Lamoille River with its seven falls between Milton Falls and West Milton provided this water power and a large number of mills were built on it. The entire Town was originally covered by pine timber which the early settlers cut and prepared for the Quebec market. The timbers were rafted to Quebec by way of the Lamoille River, Lake Champlain, the St. Lawrence, and Sorel Rivers. With the depletion of the timber supply, the people of Milton turned their energies to agriculture and small businesses and industries. From the period 1810 to 1850, the Town of Milton saw its greatest prosperity with tanneries, papermills, grist mills, small stores and shops, hotels, fulling mills, and a brick yard successfully operating there. The population of the Town of Milton reached its peak in 1950 at 2451 people with each succeeding census showing a decrease.

The Stream and Its Valley

The Lamoille River has its headwaters in the Towns of Greensboro and Wheelock at elevations exceeding 1800 feet. The watershed of the Lamoille River forms part of the drainage divide which separates those streams that flow southerly and easterly to the Connecticut River and those streams that flow westerly to Lake Champlain. The Lamoille River flows westerly to Lake Champlain which in turn empties into the St. Lawrence River.

The watershed of the Lamoille is characterized by steeply sloped woodland. In the study reach from Lake Champlain to West Milton, the river banks are generally of medium height and are bordered by a wide flood plain. The river above West Milton to the end of the study reach is controlled almost entirely by the hydroelectric power dams and has the appearance of a series of 3 lakes. The river channel falls 172 feet in the study reach for an average slope of 18.1 feet per mile. Most of this river drop is harnessed for hydroelectric power generation. A listing of the drainage areas at various locations within the study reach is shown in Table 1.

The only significant development in the study reach is the Village of Milton at the lower end of Arrowhead Lake. Most of this community lies above the flood plain.

The study reach also includes 2.3 miles of Arrowhead Lake. This Lake is created by the Clarks Falls Dam and extends approximately 3.2 miles north from the dam.

The climate of the area is characterized by the cool summers and cold winters which are typical of northern New England. Normal summer temperatures are in the low 70's and winter temperatures can reach 20° below zero. Annual precipitation over the basin averages 40 inches per year and the average annual temperature is approximately 45°.

TABLE 1
DRAINAGE AREAS

Location	Miles Above Mouth	Drainage Area
		sq. mi.
At Mouth	-	706
At West Milton	5.4	699
At Milton Station Dam	9.0	692
At Clarks Falls Dam	9.5	690

Developments in the Flood Plain

From the mouth of the river at Lake Champlain to West Milton the flood plain is mostly undeveloped fields used for farming. The remainder of the flood plain is either marshland or woodland. Near the U.S. Route 2 bridge there are several small homes along the river which are subject to flooding.

In West Milton there are several homes and farm buildings which lie immediately adjacent to the river and are subject to flooding.

Upstream from West Milton to Milton Village, the flood plain consists of undeveloped woodland.

The Village of Milton lies on the flood plain and highland immediately adjacent to the river between the Clarks Falls and Milton hydroelectric stations. Some of the commercial and residential parts of the Village are subject to flooding.

There are three dams located on the Lamoille River in the study reach all of which are used for hydroelectric power generation. Two of the three dams have no significant flood regulatory capability and the third dam has limited flood regulatory capability. These dams are not intended to act as flood control structures and are not operated as such.

FLOOD SITUATION

Sources of Data and Records

Streamflow records were obtained from a U.S. Geological Survey (U.S.G.S.) water stage recorder station on the Lamoille River now located above the study reach in East Georgia. The period of record for this gage is from August 1929 to the present time.

TABLE 2
U.S.G.S. GAGING STATION

Lamoille River

Location	Drainage Area	Period of Record
	sq. mi.	
"Near Milton" (2.3 miles downstream of East Georgia Gage)	698	August 1929 - December 4, 1937
East Georgia (1 mile downstream of Beaver Meadow Brook)	686	May 7, 1938 - Present

To supplement the records at the gaging stations, newspaper files, historical documents and records were searched for information concerning past floods.

Maps prepared for this report were based on the U.S. Geological Survey 7½ minute quadrangle sheets entitled, "Milton, Vermont" 1948, "Georgia Plains, Vermont" 1948, "Fort Ethan Allen, Vermont" 1948, and the 15 minute quadrangle sheet entitled, "Milton, Vermont".

Flood Season and Flood Characteristics

Major floods have occurred in the study reach of the Lamoille River during all seasons of the year except mid-winter. Even though spring is the normal period of high river flow due to snow melt and rainfall, it is by no means the only time of the year when flooding can occur. As in most of the wooded sections in New England, the runoff potential varies greatly with the season. Flooding within the study reach is affected primarily by the intensity and duration of rainfall in areas further upstream because most of the drainage area of the river lies above the study reach. The rate of rise of floodwater from Arrowhead Lake Dam through West Milton is fairly rapid being affected only slightly by the three dams. The duration of flooding is fairly short through this area. The portion of the study reach from West Milton to the mouth of the river will experience a slow rise in floodwater and a longer duration of flooding because of the wide flood plain in that area.

The Lamoille River is susceptible to various types of floods, but the most severe generally result from storms delivering very intense rainfall in short periods, rather than long duration less intense storms. This is probably due to the steepness of the drainage area and the lack of significant detention, allowing rapid runoff of rainfall. The high intensity storms are typically of tropical origin. In addition to floods caused by rainfall alone, the area is subject to flooding caused by rainfall in combination with snow melt and ice jams or any combination of all three factors. Ice jams usually happen during the late winter or early spring but have occurred earlier in the winter.

Factors Affecting Flooding and Its Impact

Obstructions to flood flows--Obstructions to flood flows can be either natural or man-made. Natural obstructions that can impede flood flows include sharp bends in stream channel alignment, channel constrictions due to the topography of adjacent terrain, shoaling, rock outcrops in the stream or on the flood plain, and vegetation such as grass, brush, or trees in the stream or on the flood plain. Man-made obstructions that can impede flood flows include bridges, culverts, dams, levees, and encroachment on the flood plain. These man-made obstructions can severely restrict flow and cause a backwater condition which creates more flooding than normally would occur. The restriction which causes backwater can be accompanied by a local downstream increase in velocity and release of energy which can cause erosion and structural damage. Photographs of representative obstructions can be found in Figures 1 through 5. Encroachments in the form of filling in the flood plain reduce the area available for transmission and storage of floodwaters, resulting in a loss of natural storage capacity for floodwaters and in higher flood stages upstream from the filling. Although extensive filling is not in evidence in the Towns of Colchester and Milton, awareness of the potential problem is important.

During floods various types of buoyant material such as trees, brush, and other debris can be picked up by the floodwaters and carried downstream to collect at bridges and other obstructions. This debris accumulation can act as a dam causing the water level behind it to increase and cause additional flooding upstream, or it can cause downstream flooding when masses of debris break loose and send a wall of water and debris downstream. Debris can collect against a bridge until the load from the water and debris exceeds the bridge's structural capacity and the bridge is destroyed. Bridges which do not have adequate flow capacity to pass the floodwaters cause the water level upstream to rise resulting in additional flooding. This type of constricting bridge causes the floodwaters velocity to increase during passage through the structure, which can cause erosion around the downstream bridge abutment and approach embankment with the result that an overlying road can be destroyed.

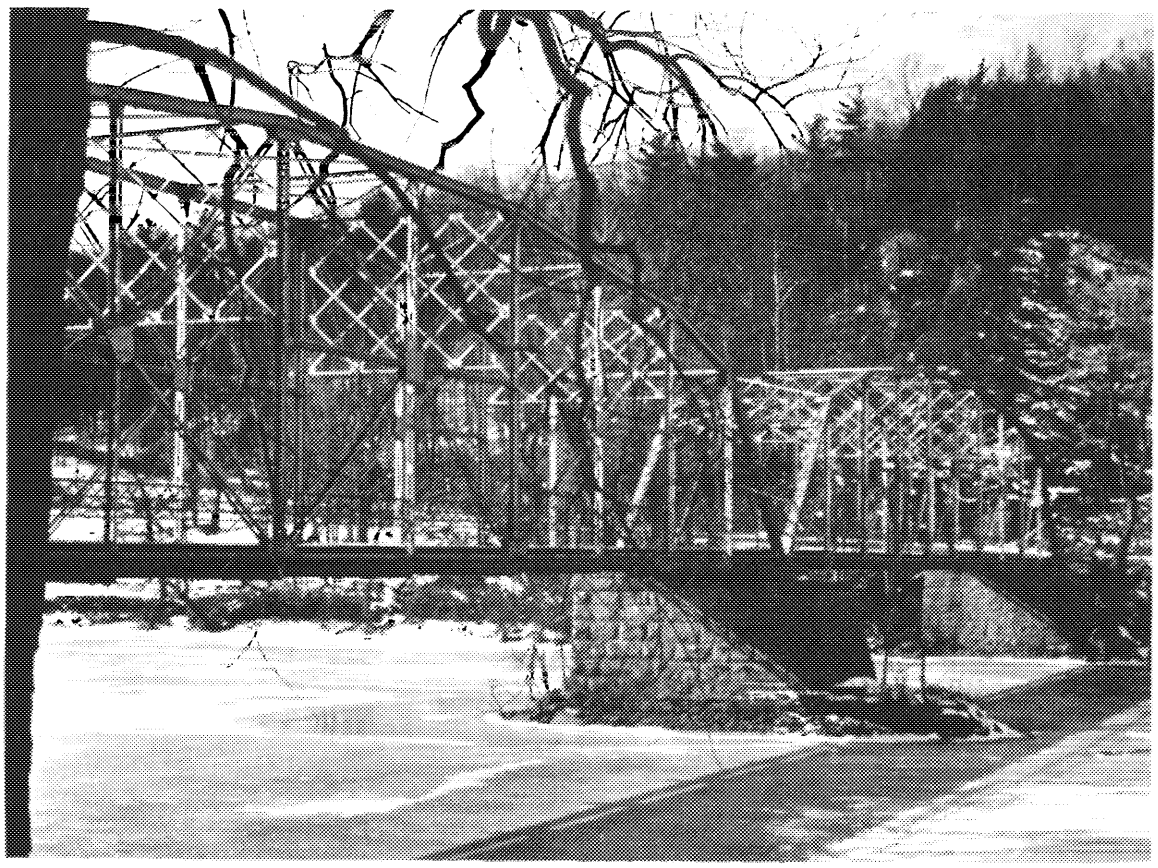


FIGURE 1 - West Milton Bridge

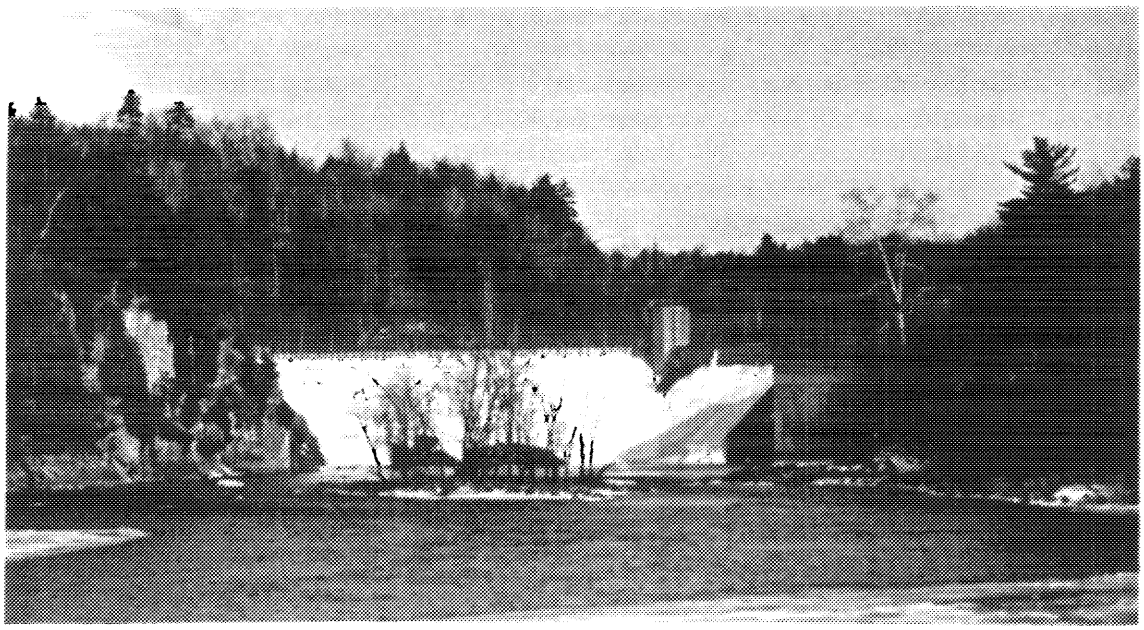


FIGURE 2 - Peterson Dam on the Lamoille River above West Milton.

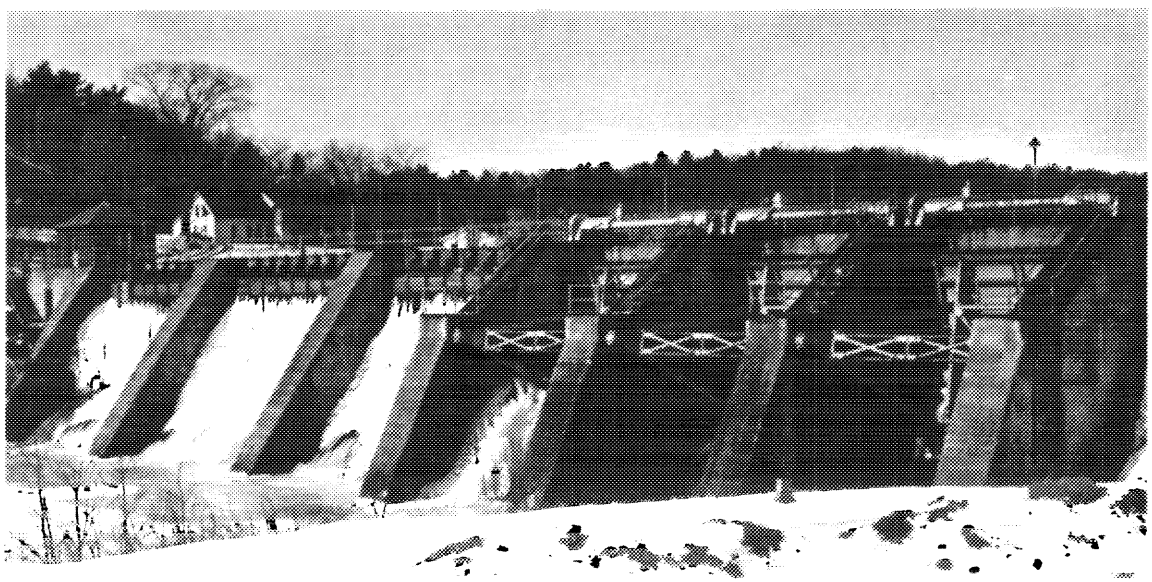


FIGURE 3 - Clarks Falls Dam which forms Arrowhead Lake.

FIGURE 4 - Main Spillway-Milton Hydroelectric Station

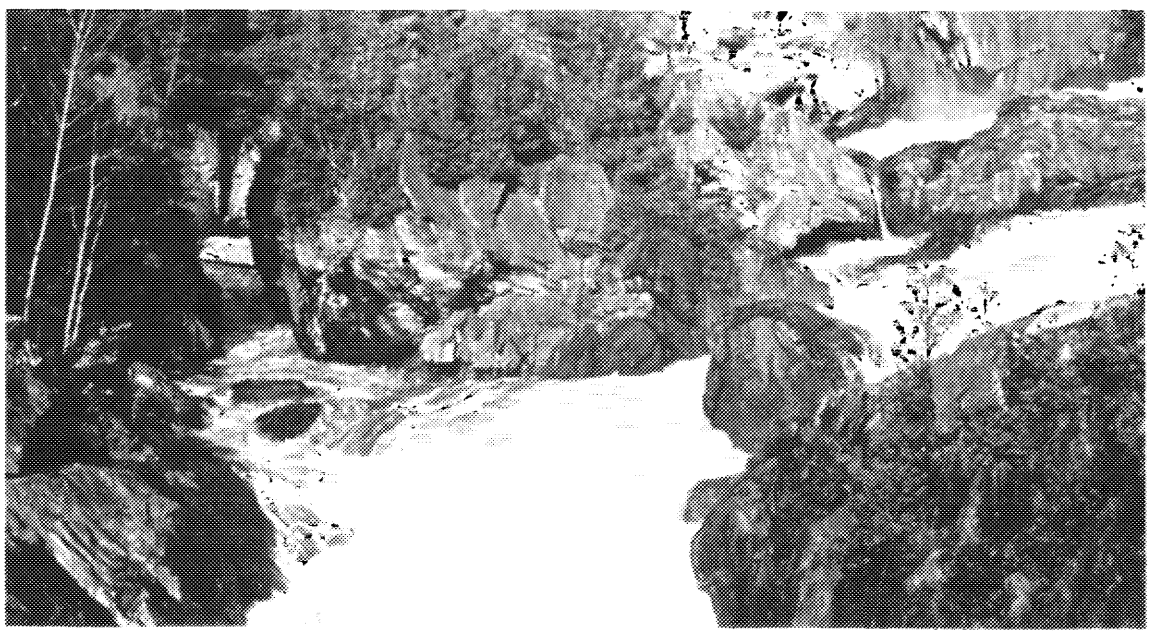


FIGURE 5 - Cataract Below Milton Hydroelectric Station

The three dams in the study reach are obstructions to flood flow. These dams do, however, have the capability of being operated to help minimize the adverse effects of flooding by proper timing of water storage and release. Conversely, the improper operation of the dams could result in an increase in flooding and flood damages.

There are no major natural obstructions to floodwaters.

The Lamoille River is spanned four times by bridges through the study reach. Pertinent information on all bridges can be found in Table 6. Two of these bridges present a significant obstruction to floodwater.

Flood damage reduction measures--The three dams located on the Lamoille River within the study area are primarily operated for hydroelectric power generation and although they have a small regulatory capability, they cannot be relied upon for significant control of floodwaters. Of the three dams, Clarks Falls Dam which creates Arrowhead Lake can have the most influence over flooding because of the storage available in the Lake and the regulatory capacity of the stanchion boards and tainter gates. The policy of the Central Vermont Public Service Corporation, which controls the dam, is to regulate the tainter gates and the stanchion boards in such a manner as to pass the floodwaters rather than detain them.

The Town of Milton has enacted zoning regulations which prohibit the construction of any structure for human habitation as well as dumping and landfilling within areas subject to periodic flooding. The use of such areas for agriculture and recreational facilities such as parks and golf courses is permitted. This zoning also applies to the Village of Milton. The Town of Colchester is presently under interim zoning regulations. The interim zoning includes review by Selectmen of development plans and individual site locations. Sites in the vicinity of flood plains receive particular attention. Final regulations are currently under preparation.

The State of Vermont has limited regulatory control in flood hazard areas under Act 250 and other land use regulations and has a law which requires and enables municipalities to develop local flood plain zoning regulations.

Other factors and their impact--The impact of flooding along the Lamoille River can be affected by the ability of local residents to anticipate and effectively react to a flood emergency. Efficient flood warning and forecasting systems can give home owners, businesses, and industries valuable time to remove damageable materials from low-lying areas. Increased damages to downstream areas can also be reduced if buoyant materials stored on the flood plain can be removed before being carried downstream to block bridge openings. Implementation of effective flood fighting and emergency evacuation plans can further reduce flood damages and the incidence of personal injury or death once the river has reached flood stage.

Flood warning and forecasting--The National Weather Service Office in Burlington maintains year-round surveillance of weather conditions for the area of Vermont in which the Lamoille River watershed is located. Flood warnings for this area are issued from Burlington simultaneously to

twelve strategically located "drop" points, to the Vermont Civil Defense Office, and to the National Alarm Warning System. All Vermont communities which may be subject to flooding are in turn provided with the flood warning through a network of chain communications.

In the case of the Lamoille River in the Town of Colchester, the initial flood warning goes to the "drop" point at the Colchester State Police Dispatcher's Office. This office notifies the Essex Junction Police Department which in turn notifies the Colchester flood emergency office.

In the case of the Lamoille River in the Town of Milton, the initial flood warning goes to the drop at the Colchester State Police Dispatcher's Office which notifies the Winooski Fire Department which in turn notifies the Milton flood emergency office.

Within this communications network is a notification to local media such as newspapers, television stations, and radio stations for their dissemination of the flood warning to the general public.

Flood fighting and emergency evacuation plans--Although there is no flood fighting or emergency evacuation plan for either the Towns of Colchester or Milton or the Village of Milton, coordination of flood emergency effort is handled through the Town Offices as the need arises.

Material storage on the flood plain--During past floods, buoyant materials have been carried downstream by floodwaters creating additional hazards. At the present time there are buoyant materials stored in flood prone areas which could be picked up by floodwaters making them floating obstructions. These materials can be carried downstream where they might collect on a fixed obstruction, possibly causing additional flooding or damage. Some of the types of existing objects in flood prone areas which may become floating debris include oil storage tanks, natural gas storage tanks, 55-gallon drums, lumber from recent construction, dead trees, telephone poles, debris from previous floods, firewood, and other miscellaneous debris. The possible washing away of shacks or homes could present particularly dangerous buoyant debris problems.

PAST FLOODS

Summary of Historical Floods

Floods on record that have caused damage on the Lamoille River occurred in November 1927, March 1936, and September 1938. Historic accounts indicate that the most severe flood was the flood of November 3, 1927. The Flood of 1936 was caused by rainfall in combination with snow melt. The Flood of 1938 was caused by the rainfall associated with a hurricane. Damage resulting from high water of the 1936 and 1938 Floods was moderate. The Flood of 1927 caused extensive property damage.

Flood Records

Peak flows and stages recorded by the U.S. Geological Survey gage on the Lamoille River were obtained from U.S.G.S. files and from their current annual publication **Water Resources Data For Massachusetts, New Hampshire, Rhode Island, and Vermont.** The flood records are shown in Table 3. Descriptions of past floods were obtained from the Montpelier Historical Library from books entitled, **Floodtide of 1927** and **Vermont in Floodtime.** Some flood descriptions were taken from previous issues of **The Burlington Free Press** and **St. Albans Weekly Messenger** newspapers. Locations of high water marks were obtained from residents who lived along the river and had a personal knowledge of past floods and the Corps of Engineers "308" report (House of Representatives Document 145).

TABLE 3
FLOOD CREST ELEVATIONS

Ten Highest Floods Recorded
U.S.G.S. Gage at East Georgia, Vermont

Date of Crest	Peak Discharge	Stage	Elevation
	c.f.s.	ft.	ft.-m.s.l.d.
November 3, 1927 [1]	88,000	unknown	unknown
March 19, 1936*	23,200	unknown	unknown
September 22, 1938	20,200	11.60	296.60
June 15, 1942	19,400	11.40	296.40
June 30, 1973	17,000	10.80	295.80
April 13, 1934*	16,600	unknown	unknown
April 19, 1933*	16,300	unknown	unknown
April 13, 1947	16,100	10.58	295.58
May 5, 1973	15,500	10.43	295.43
April 22, 1958	15,100	10.33	295.33

[1] Approximation of discharge at Milton Village from report on Lamoille River by Office of Chief of Engineers, War Department to the Secretary of War following the 1927 Flood.
* Recorded a short distance downstream at old gage location.

Flood Descriptions

In November 1927 a large amount of rainfall occurred on a moisture saturated and partially frozen ground surface. The dormant vegetation did little to retard the rainfall and a rapid runoff occurred resulting in a high peaked hydrograph. The antecedent wet conditions extended the duration of flooding longer than would normally occur. Much damage resulted from this flood.

The Flood of 1927 had such a large impact on the affected communities that graphic descriptions were recorded.

Excerpts from VERMONT IN FLOODTIME - 1927 Flood

Lamoille Valley

"The Lamoille River and its ordinarily peaceful valley contributed their toll to the flood loss. In that section four persons lost their lives, dams broke loose, a railroad was disorganized, industry suffered grievously and scores of homes were washed away...

Surging on, the Lamoille carried away the bridge in the Village of Milton, the building of the Franklin County Trust Co., the Star Theatre operated by Earl Bevins, the wheel-wright shop of H.C. Bevins and Kennedy's store. Orvis Mayville's big brick house with all its furniture was undermined and crashed. All buildings in this section of the Village, up to the general store of O.S. Phelps & Co., which was saved by the construction of a coffer dam, were wiped out. The safes and valuables in the bank were removed.

On the lower end of River Street, houses...were either moved from their foundations or otherwise badly demolished, in many cases with complete furnishings...Barns and shops in connection with these buildings went also. The houses on the river side of the road were damaged more extensively than those on the opposite side.

The bridge at West Milton was the only one usable for a long distance up the stream. Much debris accumulated at this bridge. Parts of houses, bridges, and all kinds of wreckage caught on the piers and once a part of a house was seen floating down the river with a bed set up--all made up.

At West Milton the Deslaureau barns went out partially and Isaac Howard's were turned around. The horses and cattle on these two farms and on the Clark farm, about 160 in all, were drowned with the exception of a few young cattle on the Clark farm. All the stock in Granger's store was destroyed. All the residents along the river were compelled to flee with scarcely time to save anything on the ground floors of their homes.

One abutment of the State bridge over the Lamoille on the way to Grand Isle was shattered, but the bridge did not go down.

Soon after the disaster, Red Cross workers reached Milton and rendered material assistance to the stricken town. Funds were provided to supply all needed food and clothing."

Excerpts from the BURLINGTON FREE PRESS - November 7, 1927

"A ravaging Lamoille River that snuffed out several human lives farther up the valley showed no mercy to the Villages of Milton, West Milton, and East Georgia. A veritable cataract, it spumed down through Milton Village, carrying along its mighty onrush, the bridge and three important buildings...and lifting more than a dozen buildings from their foundations. Never in the annals of Lamoille River valley have such stories of widespread devastation...been reported. As the waters of the Lamoille tumbled through Milton, scores of River Street residents were made homeless, and barns were whirled around like corks by the onslaught of the stream Friday forenoon."

Excerpts from ST. ALBANS WEEKLY MESSENGER

November 11, 1927

"The buildings housing the Franklin County Banks, the moving picture theater, a grist mill, a grocery store, and the main bridge on the St. Albans-Burlington Highway at Milton was swept down the river at noon today."

"Milton reports this morning said that at least 12 houses have been swept away...At least one house in West Milton has floated away."

November 5, 1927

"Milton is probably hit as hard as any town in the State except Montpelier and Barre."

"...The Lamoille River overflowed its banks for a vicinity of about a mile doing damage that will amount to thousands of dollars."

"...Many farms, buildings, and barns were swept down the River in the vicinity of the Villages..."

Excerpts from BURLINGTON DAILY NEWS

November 4, 1927

"Reports from Milton this morning indicate heavy property damage in that Village. The bridge over the Lamoille River went out at the crest of the flood night before last and four buildings in the hollow were completely destroyed and ten or twelve others moved from their foundations. It is said that many of these are damaged beyond repair.

Warning of the impending flood conditions was made at Milton about one o'clock Thursday night. Families made haste to evacuate their homes and save what valuables they could. Neighbors on high grounds gave them housing for the night and are caring for them temporarily. Furniture in their homes was either badly damaged or swept away by the high water.

When the crest of the flood hit the hollow, it swept the bridge down into the gorge below and the mass of wreckage and the pressure of waters toppled the brick building known as the Bevine Block and containing the Village movie theater. At the same time, the building housing the Kennedy store was wiped out. In all, four buildings were a total loss and there is every indication that most of the ten or a dozen other houses damaged are beyond repair."

In March 1936 rainfall in combination with snow melt brought many Vermont streams and rivers to flood stages. Locally, heavy flooding was the result of high water in combination with ice jams. Only moderate damage resulted from this flood.

In September 1938 an intense rainfall accompanied a tropical storm of hurricane magnitude. Floodwater rose to high levels but caused only moderate damage. Damage was minimized because people rebuilt homes at higher elevations and bridges less restrictive to floodwaters following the 1927 Flood. Much damage was caused by high winds associated with this hurricane.

FIGURE 6 - Lamoille River flooding in Milton, Vermont during the Flood of 1927.

FIGURE 7 - South River Street in Milton on November 4, 1927.

FIGURE 8 - Flooded homes on South River Street in Milton during the Flood of 1927.

FIGURE 9 - Site of the Milton bridge across the Lamoille River after it was washed out during the 1927 flooding.

FIGURE 10 - Flooded homes in Milton during the Flood of 1927.

FIGURE 11 - Building being washed away by the floodwaters of the Lamoille River in 1927.

FUTURE FLOODS

Floods of the same or larger magnitude as those that have occurred in the past could occur in the future. Larger floods have been experienced in the past on streams with similar geographical and physiographical characteristics as those found in the study area. Similar combinations of rainfall and runoff which caused these floods could occur in the study area. Therefore, to determine the flooding potential of the study area, it was necessary to consider storms and floods that have occurred in regions of similar topography, watershed cover, and other physical characteristics. Discussion of future floods in this report is limited to those that have been designated as the 100 Year Flood and the 500 Year Flood. The estimates of the 100 Year Flood and the 500 Year Flood as presented in this report are based on the existing development of the watershed since future changes within the basin cannot be accurately predicted. The 500 Year Flood represents a reasonable upper limit of expected flooding in the study area. The 100 Year Flood may reasonably be expected to occur more frequently although it will not be as severe as the infrequent 500 Year Flood.

100 Year Flood

The 100 Year Flood is the flood having an average frequency of occurrence of once in 100 years although it can occur in any year. It is sometimes known as the Intermediate Regional Flood and has also been defined as a flood that has a one percent chance of occurring in any one year.

500 Year Flood

The 500 Year Flood is defined as a major flood that has an average frequency of occurrence of once in 500 years although it could occur in any year, or a flood that has a o.2 percent chance of occuring in any one year.

The Corps of Engineers, in cooperation with the U.S. Geological Survey, has made investigations of the peak discharges for experienced floods and has utilized the Log Pearson Type III statistical analysis for estimating the flood potential of this river. The peak discharges of the 100 Year and 500 Year Floods were determined from the Log Pearson Type III statistical analysis of stream flow records for the Lamoille River. Peak discharges for the 100 Year and 500 Year Floods at selected locations in the study area are shown in Table 4. Discharge hydrographs for the 100 Year Flood and the 500 Year Flood at West Milton are shown on Plates 19 and 20. The relative water surface elevations for the 100 Year Flood and the 500 Year Flood are shown on Plates 12 through 16.

TABLE 4

PEAK FLOWS FOR THE 100 YEAR AND 500 YEAR FLOODS

Lamoille River

Location	Miles Above Mouth	Drainage sq. mi.	100 Year Flood cfs	100 Year Flood cfs/mi2	500 Year Flood cfs	500 Year Flood cfs/mi2
Lamoille River at Mouth	0	706	45,815	65	73,095	104
Lamoille River at West Milton	5.4	699	45,345	65	72,345	103

Table 5 shows comparisons of flood elevations for the 100 Year and 500 Year Floods with the highest recorded floods at the U.S. Geological Survey gage at East Georgia, Vermont.

TABLE 5

COMPARISONS OF FLOOD ELEVATIONS
U.S.G.S. Gage at East Georgia, Vermont

Flood	Elevation ft.-m.s.l.d.
500 Year [1]	309.50
100 Year [1]	306.50
September 22, 1938	296.60
June 15, 1942	296.40
June 30, 1973	295.80

[1] Estimated from rating curve

Frequency

A frequency curve of flood flows was developed from available recorded annual peaks. The curve presents the frequency of flood flows up to the magnitude of once in 100 years. Flood flows for the 500 Year Flood were obtained through extrapolation of the curve. The curve, which is available upon request, reflects the judgment of the engineers who have studied the areas and are familiar with the region; however, it must be regarded as approximate and should be used with caution in connection with any planning of flood plain use.

Hazards of Large Floods

The extent of damage caused by any flood depends on the topography of the area flooded, depth and duration of flooding, velocity of flow, rate of rise of floodwaters, and developments in the flood plain. A 100 Year or 500 Year Flood on the Lamoille River would result in the inundation of residential and commercial properties. Deep floodwaters flowing at high velocity and carrying floating debris would create conditions hazardous to persons and vehicles attempting to cross flooded areas. In general, floodwaters three or more feet deep and flowing at a velocity of three or more feet per second could easily sweep an adult person off his feet, thus creating definite danger of injury or drowning. Rapidly rising and swiftly flowing floodwaters may trap persons in homes that are ultimately destroyed or in vehicles that are ultimately submerged or flooded. Water lines can be ruptured by deposits of debris and the force of floodwaters, thus creating the possibility of contamination of domestic water supplies. Damaged sanitary sewer lines and wastewater treatment facilities could result in the pollution of floodwaters creating health hazards. Isolation of areas by floodwaters could create hazards in terms of medical, fire, or law enforcement emergencies.

Flooded areas and flood damages--The areas along the study reach of the Lamoille River that would be flooded by the 100 Year Flood and the 500 Year Flood are shown on Plate 2 which is also an index map to Plates 3 through 11. Areas that would be flooded by the 100 Year and 500 Year Floods are shown in detail on Plates 3 through 11. The actual limits of these overflow areas may vary somewhat from those shown on the map because the 20-foot contour interval and scale of the map do not permit precise plotting of the flooded area boundaries. As may be seen from these plates, floodwaters from the Lamoille River inundate residential and commercial properties in the Village of Milton and the community of West Milton, resulting in considerable damage and necessitating costly expenditures for emergency relief, clean up, and repair. Additional hardships include loss of utility service and transportation facilities and health hazards associated with contaminated water supplies. Considerable damage to these facilities would occur during a 100 Year Flood. However, due to the wider extent, greater depths of flooding, higher velocity of flow, and longer duration of flooding during a 500 Year Flood, damage would be even more severe than that experienced from a 100 Year Flood.

Plates 12 through 16 show the water surface profiles for the 100 Year and 500 Year Floods. Depth of flow in the stream channel can be estimated from these illustrations. Cross sections of the flood plain at selected locations, together with water surface elevations and the lateral extent of the 100 Year and 500 Year Floods are shown on Plates 17 and 18.

Obstructions--During floods, debris collecting on bridges and culverts could decrease their flow

capacity and cause greater water depth (backwater effect) upstream of these structures. Since the occurrence and amount of debris are indeterminate factors, only the physical characteristics of the structures were considered in preparing profiles of the 100 Year and 500 Year Floods. Similarly, the maps of flooded areas show the backwater effect of obstructive bridges and dams, but do not reflect the increased water surface elevation caused by debris accumulation or by deposition of silt in the stream channel under structures.

As previously indicated, there are three dams within the study area all of which have only a limited amount of flood control capability. The complex hydraulic conditions at the location of the Great Falls Dam between cross sections 39 and 40 prohibits an accurate portrayal of the flood profile and flooded areas at that location. The flooded areas and profiles there shown should be considered approximate.

It is difficult to predict the degree or location of the accumulation of debris; therefore for the purposes of this report, it was necessary to omit this factor in the development of the flood profile. The destruction of bridges or other hydraulic structures by floodwaters was not anticipated and not included in the calculations of the flood profiles in that the timing, cause, and results of such failures are almost impossible to predict in advance.

Of the four studied bridges crossing the Lamoille River, only one is obstructive to the 100 Year Flood and two are obstructive to the 500 Year Flood. Table 6 shows the water surface elevation at these bridges.

TABLE 6
ELEVATION DATA

Bridges Across the Lamoille River

Identification	Mileage Above Mouth	Underclearance Elevation	Water Surface Elevation 100 Year Flood	Water Surface Elevation 500 Year Flood
		ft.-m.s.l.d.	ft.-m.s.l.d.	
U.S. Route 2 Bridge	1.7	112.9	108.13	112.19
West Milton Bridge	4.7	112.0	113.00	117.82
Interstate 89 Bridges	7.1	194.3	156.41	160.00
U.S. Route 7 Bridge in Milton Village	8.6	280.8	277.80	285.50

Velocities of flow--Velocities of floodwaters depend largely on the characteristics of the stream channel and overbank areas. The size and shape of stream cross sections, the conditions of the stream and bank such as ground cover, and the slope of the stream bed all vary at different locations on the same stream. During a 100 Year Flood, velocities of the main channel would average approximately 7 feet per second on the Lamoille River. Water flowing at this rate is capable of transporting large objects and severely eroding stream banks and fill around bridge abutments. It is expected that velocity of the main channel flow during a 500 Year Flood would be slightly higher than during a 100 Year Flood. Overbank flows for the 100 Year Flood would average approximately 1.5 feet per second on the Lamoille River. Water flowing at 2 feet per second or less would deposit debris and silt. Table 7 lists the maximum velocities that would occur in the main channel and overbank areas of the Lamoille River during the 100 Year and 500 Year Floods.

TABLE 7
MAXIMUM AVERAGE VELOCITIES

Lamoille River

Location	Mileage Above Mouth	Maximum Average Velocities			
		100 Year Flood		500 Year Flood	
		Channel	Overbank[b]	Channel	Overbank[b]
		ft/sec	ft/sec	ft/sec	ft/sec
Lamoille River					
Cross Section #3	.8	6.75	1.20	7.91	1.51
Cross Section #5	1.3	6.81	1.78	8.50	2.73
Cross Section #9	1.8	6.80	3.15	8.68	4.42
Cross Section #16	4.1	3.46	1.15	3.34	1.28
Cross Section #21	4.9	5.45	1.89	6.84	2.71
Cross Section #32 (a)	7.1	7.10	1.91	9.46	2.86
Cross Section #42	8.4	6.31	1.64	7.59	2.25
Cross Section #44	8.5	14.50	3.62	19.20	4.59
Cross Section #48 (a)	8.6	7.32	0	8.40	1.37

(a)In reaches affected by bridges.
(b)Value given is greater of the left or right overbank velocity.

Rates of rise and duration of flooding--Intense rainfalls that accompany severe storm fronts usually produce the floods occurring along the Lamoille River. There is usually a time lag of several hours before flooding occurs along the stream banks. Floods on the Lamoille River generally can be expected to rise fairly rapidly and remain out of the banks for relatively short periods of time. Table 8 gives the maximum rate of rise and height of rise (from critical stage level to maximum flood flow level), time of rise (time period corresponding to height of rise), and duration of flooding (period of time flooding is above critical stage level) for the 100 Year and 500 Year Floods, on the Lamoille River at West Milton, Vermont.

TABLE 8
RATES OF RISE AND DURATION [1]

Lamoille River at West Milton, Vermont

Flood	Maximum Rate Of Rise	Height Of Rise	Time Of Rise	Duration Of Flood
	ft./hr.	ft.	hrs.	hrs.
100 Year	0.42	11.5	60	132
500 Year	0.48	14.0	60	198

[1]Above Critical Stage.

Photographs, future flood heights--The levels that the 100 Year and 500 Year Floods are expected to reach at various locations along this study reach of the Lamoille River are indicated on the following photographs.

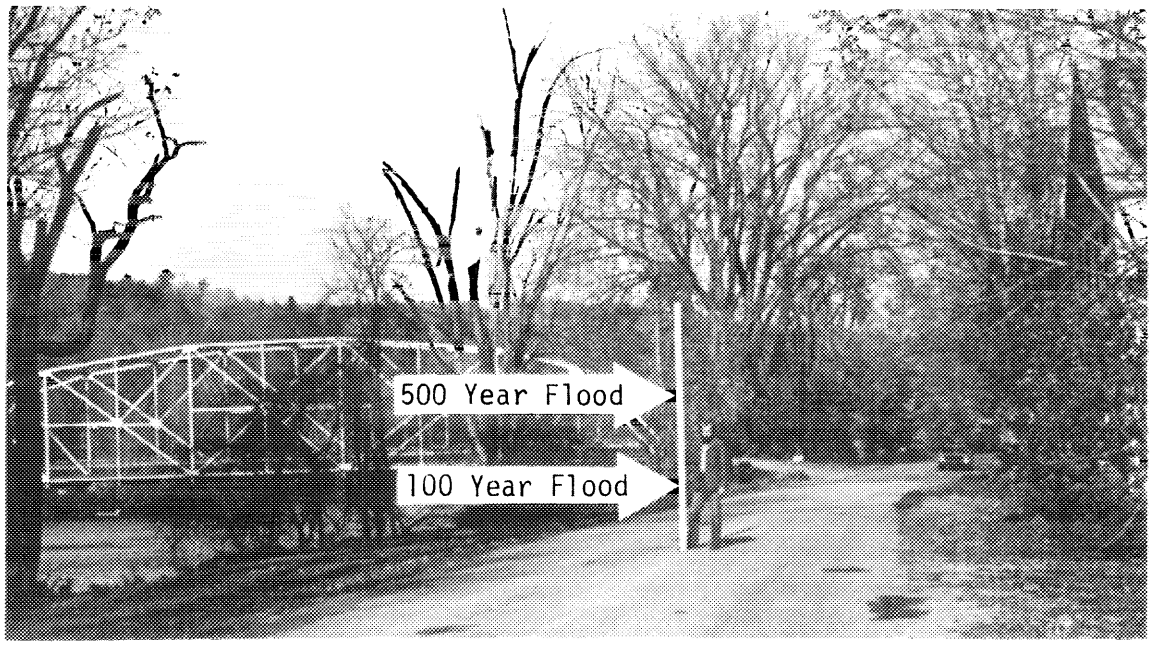


FIGURE 12 - Future flood heights in West Milton.

FIGURE 13 - Future flood heights at the West Milton Bridge.

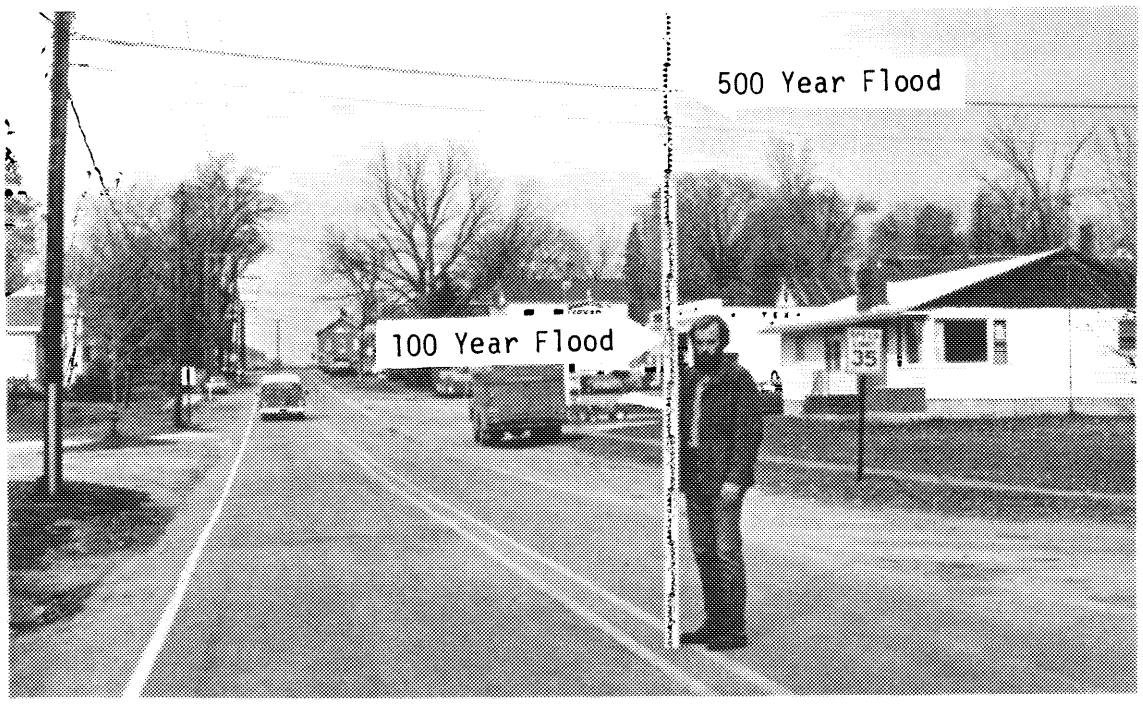


FIGURE 14 - Future flood heights along U.S. Route 7 in the Village of Milton.

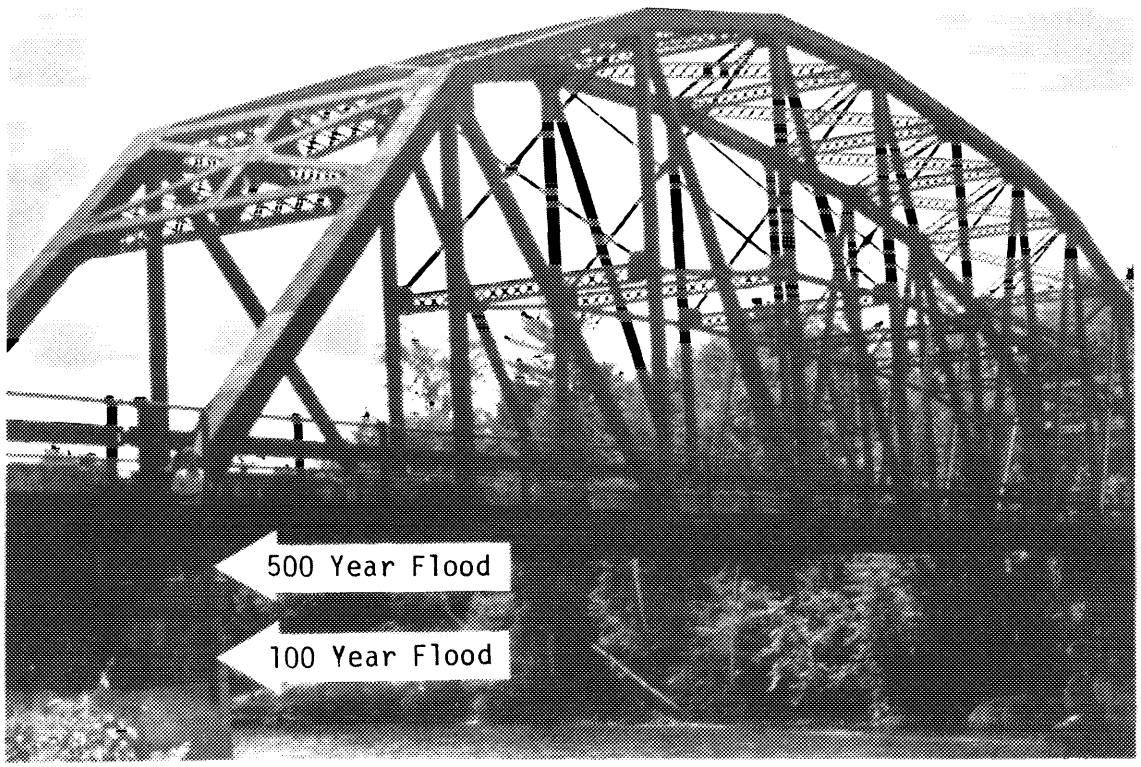


FIGURE 15 - Future flood heights at the U.S. Route 2 bridge.

GLOSSARY

Backwater. The resulting high water surface in a given stream due to a downstream obstruction or high stages in an intersecting stream.

Flood. An overflow of lands not normally covered by water and that are used or usable by man. Floods have two essential characteristics: the inundation of land is temporary; and the land is adjacent to or inundated by overflow from a river, stream, ocean, lake, or other body of standing water.

Normally a "flood" is considered as any temporary rise in streamflow or stage, but not the ponding of the water surface, that results in significant adverse effects in the vicinity. Adverse effects may include damages from overflow of land area, temporary backwater effects in sewers and local drainage channels, creation of unsanitary conditions or other unfavorable situations by deposition of materials in stream channels during flood recessions, rise of groundwater coincident with increased streamflow, and other problems.

Flood Crest. The maximum stage or elevation reached by the waters of a flood at a given location.

Flood Plain. The areas adjoining a river, stream, watercourse, ocean, lake, or other body of standing water that have been or may be covered by floodwaters.

Flood Profile. A graph showing the relationship of water surface elevation to location, the latter generally expressed as distance above mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditions at a given time or stage.

Flood Stage. The stage or elevation at which overflow of the natural banks of a stream or body of water begins in the reach or area in which elevation is measured. This is also referred to as critical stage.

Hurricane. An intense cyclonic windstorm of tropical origin in which winds tend to spiral inward in a counterclockwise direction toward a core of low pressure with maximum surface wind velocities that equal or exceed 75 miles per hour (65 knots) for several minutes or longer at some points. Tropical storm is the term applied if maximum winds are less than 75 miles per hour.

Hydrograph. A graph showing flow values, usually measured in cubic feet per second, versus time at a given point. The area under the curve indicates the total volume of flow.

100 Year Flood. A flood having a 1 percent chance of occurrence in any one year. It is based on statistical analyses of streamflow records available for the watershed and analyses of rainfall and runoff characteristics in the general region of the watershed.

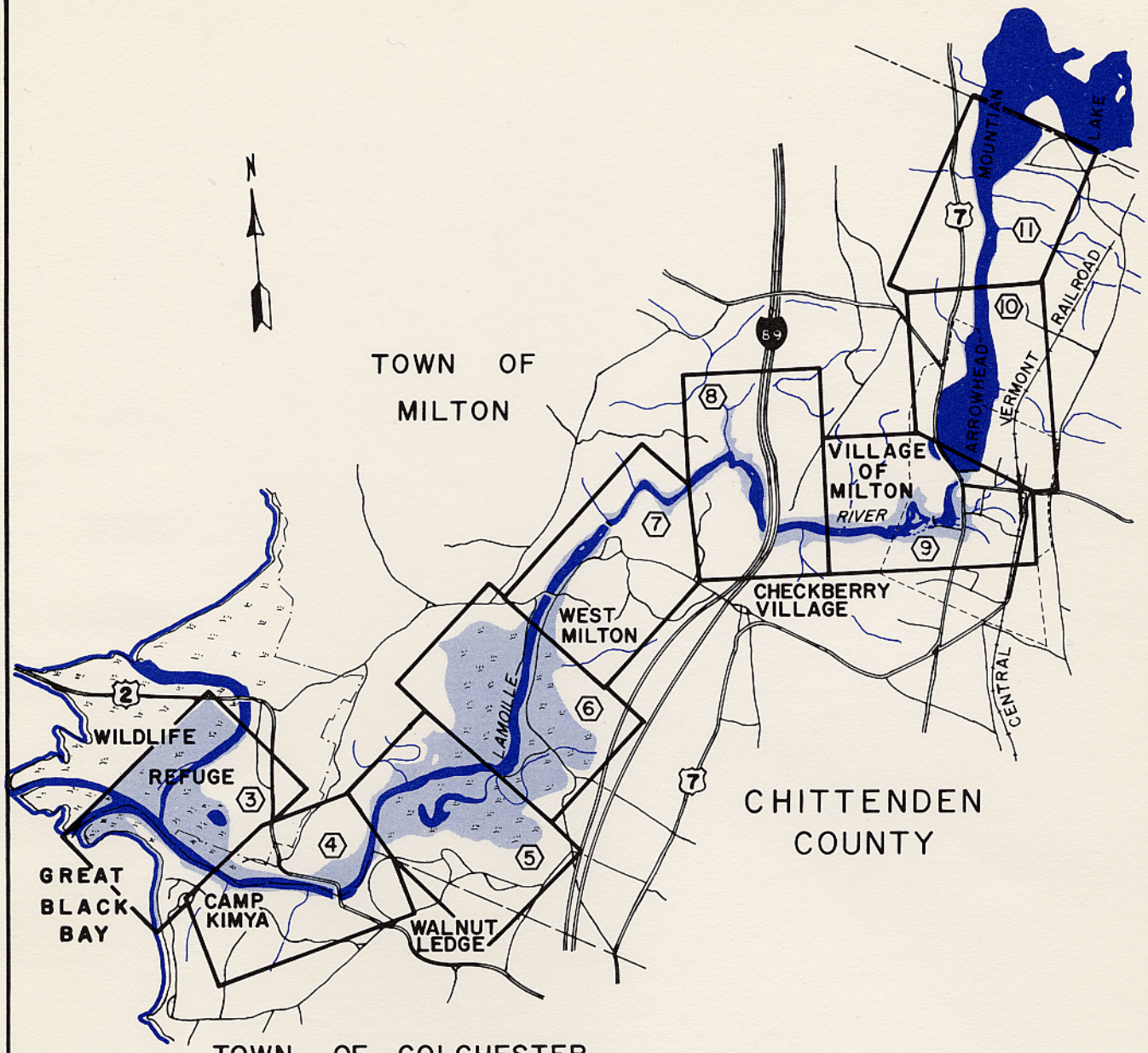
Left Bank. The bank on the left side of a river, stream, or watercourse looking downstream.

Low Bank. The lower of the two banks of a river, stream, or watercourse designated as left or right looking downstream.

Right Bank. The bank on the right side of a river, stream, or watercourse looking downstream.

500 Year Flood. A flood which has a 0.2 percent chance of occurrence in any one year. It is based on statistical analyses of streamflow records available for the watershed and analyses of rainfall and runoff characteristics in the general region of the watershed.

Underclearance Elevation. The elevation at the top of the opening of a bridge, culvert or other structure through which water may flow along a watercourse. This is referred to as "low steel" in some regions.



SCALE IN FEET

4,000 0 4,000

LEGEND

④ PLATE NUMBER

DEPARTMENT OF THE ARMY

NEW YORK DISTRICT, CORPS OF ENGINEERS

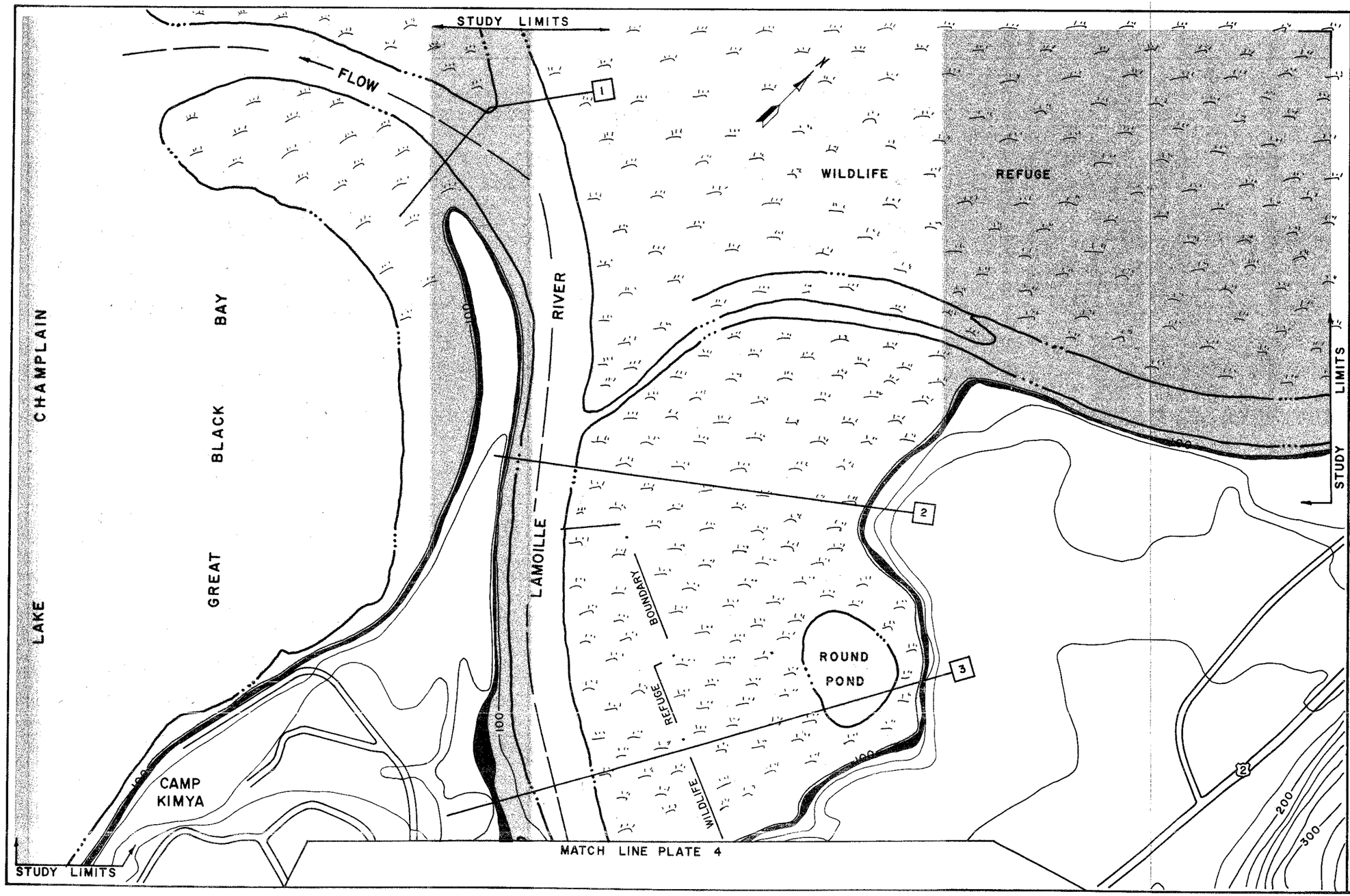
NEW YORK, NEW YORK

FLOOD PLAIN INFORMATION TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON VERMONT

INDEX MAP FLOODED AREAS

FEBRUARY 1976

PLATE 2



LEGEND

OVERFLOW LIMITS

- 100 YEAR FLOOD / 500 YEAR FLOOD
- M + 2 — MILES ABOVE MOUTH
- 6 — CROSS SECTION
- —300— GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- CHANNEL
- VILLAGE LIMITS
- TOWN LIMITS
- COUNTY LINE
- 7 — U.S. ROUTE NUMBER

NOTES

1. MAP BASED ON U.S.G.S. 7.5 MIN. QUADRANGLE FORT ETHAN ALLEN, VERMONT 1948. MINOR ADDITIONS AND MODIFICATIONS MADE BY CORPS OF ENGINEERS.
2. LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
3. AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.
4. MINIMUM CONTOUR INTERVAL IS 20 FEET.

SCALE IN FEET

0 500 1000

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NEW YORK, NEW YORK

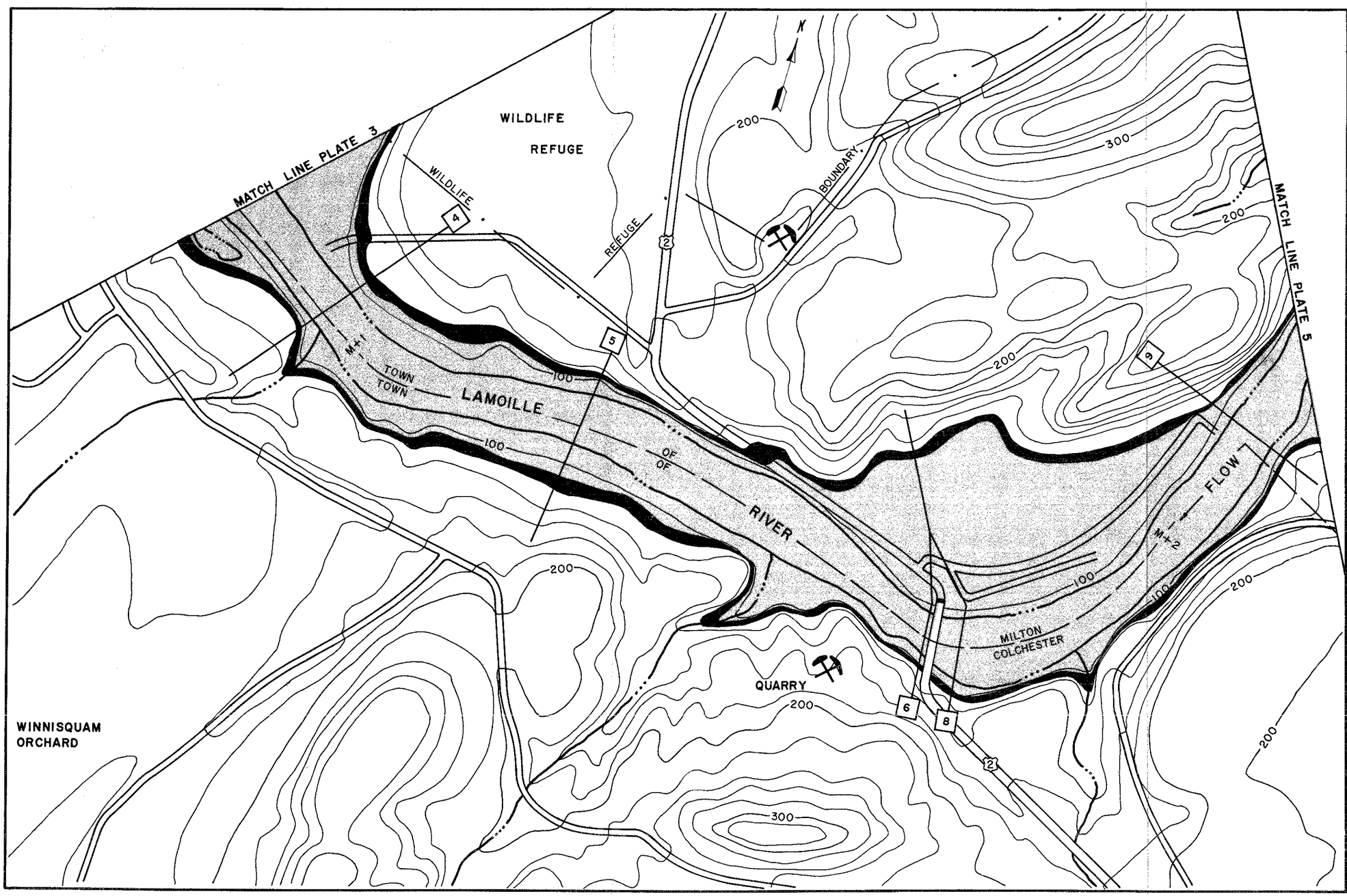
FLOOD PLAIN INFORMATION

TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

FLOODED AREAS

FEBRUARY 1976

PLATE 3



LEGEND

OVERFLOW LIMITS

- 100 YEAR FLOOD / 500 YEAR FLOOD
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- —300— GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL
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- TOWN LIMITS
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SCALE IN FEET

0 500 1000

DEPARTMENT OF THE ARMY
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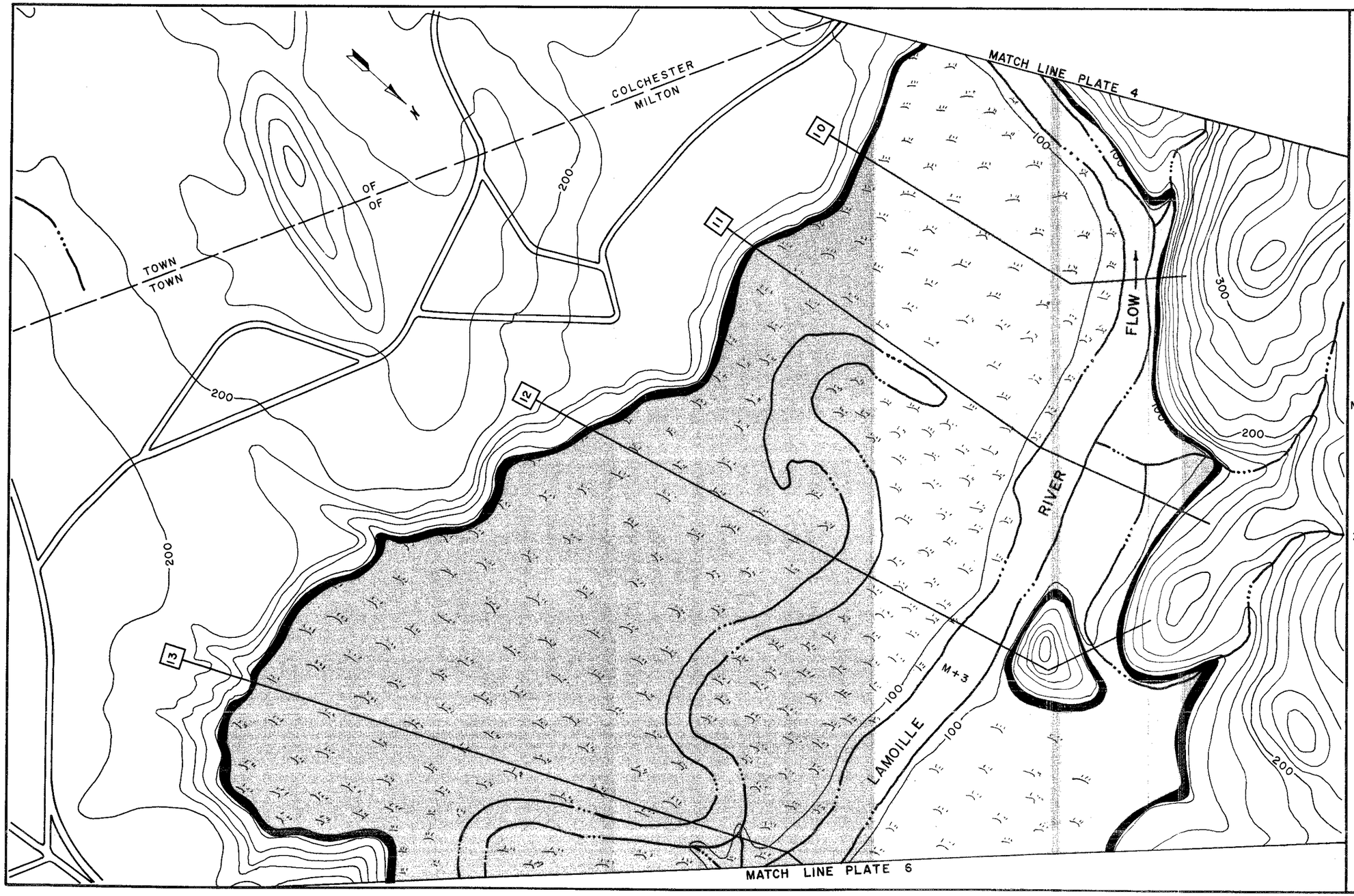
FLOOD PLAIN INFORMATION

TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

FLOODED AREAS

FEBRUARY 1976

PLATE 4



LEGEND

OVERFLOW LIMITS

- 100 YEAR FLOOD / 500 YEAR FLOOD
- M + 2 — MILES ABOVE MOUTH
- 6 — CROSS SECTION
- —300— GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- CHANNEL
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- TOWN LIMITS
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SCALE IN FEET

0 500 1000

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NEW YORK, NEW YORK

FLOOD PLAIN INFORMATION

TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

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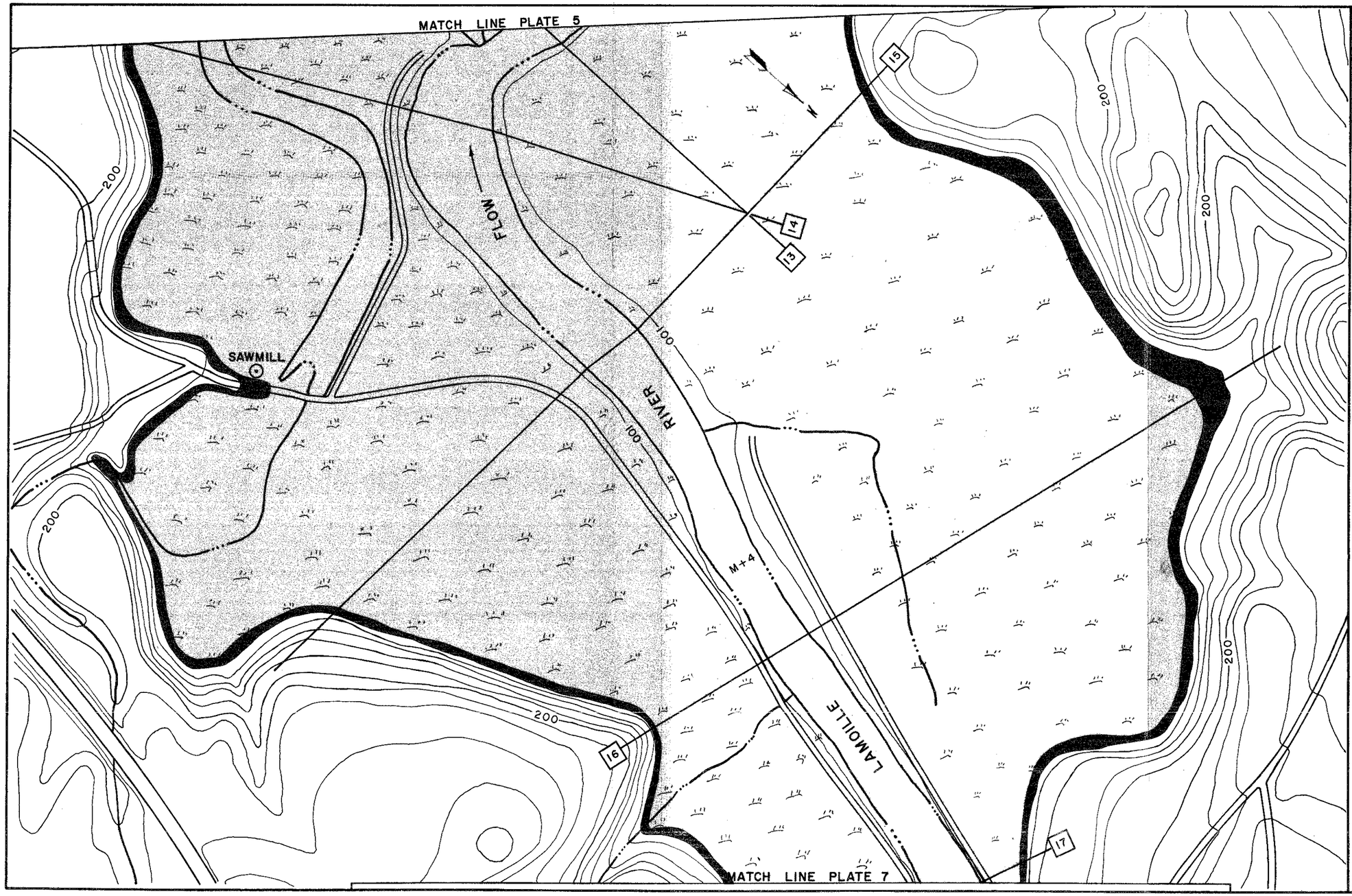
FEBRUARY 1976



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD / 500 YEAR FLOOD

M + 2 — MILES ABOVE MOUTH

6 — CROSS SECTION

—300— GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL

CHANNEL

VILLAGE LIMITS

TOWN LIMITS

COUNTY LINE

U.S. ROUTE NUMBER

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SCALE IN FEET

0 500 1000

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FLOOD PLAIN INFORMATION

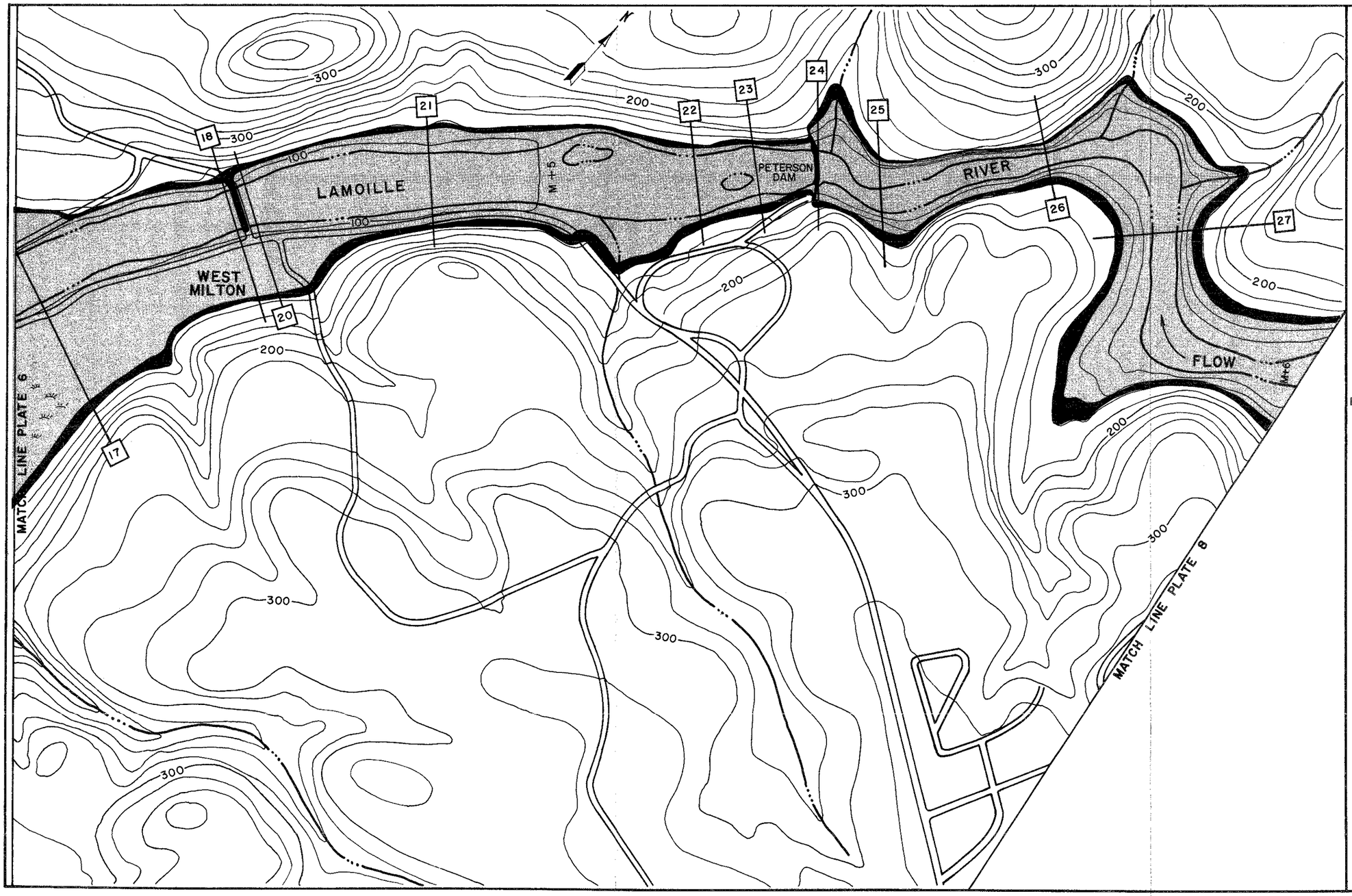
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON

VERMONT

FLOODED AREAS

FEBRUARY 1976

PLATE 6



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD / 500 YEAR FLOOD

M + 2 — MILES ABOVE MOUTH

6 — CROSS SECTION

—300— GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL

CHANNEL

VILLAGE LIMITS

TOWN LIMITS

COUNTY LINE

17 — U.S. ROUTE NUMBER

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SCALE IN FEET

0 500 1000

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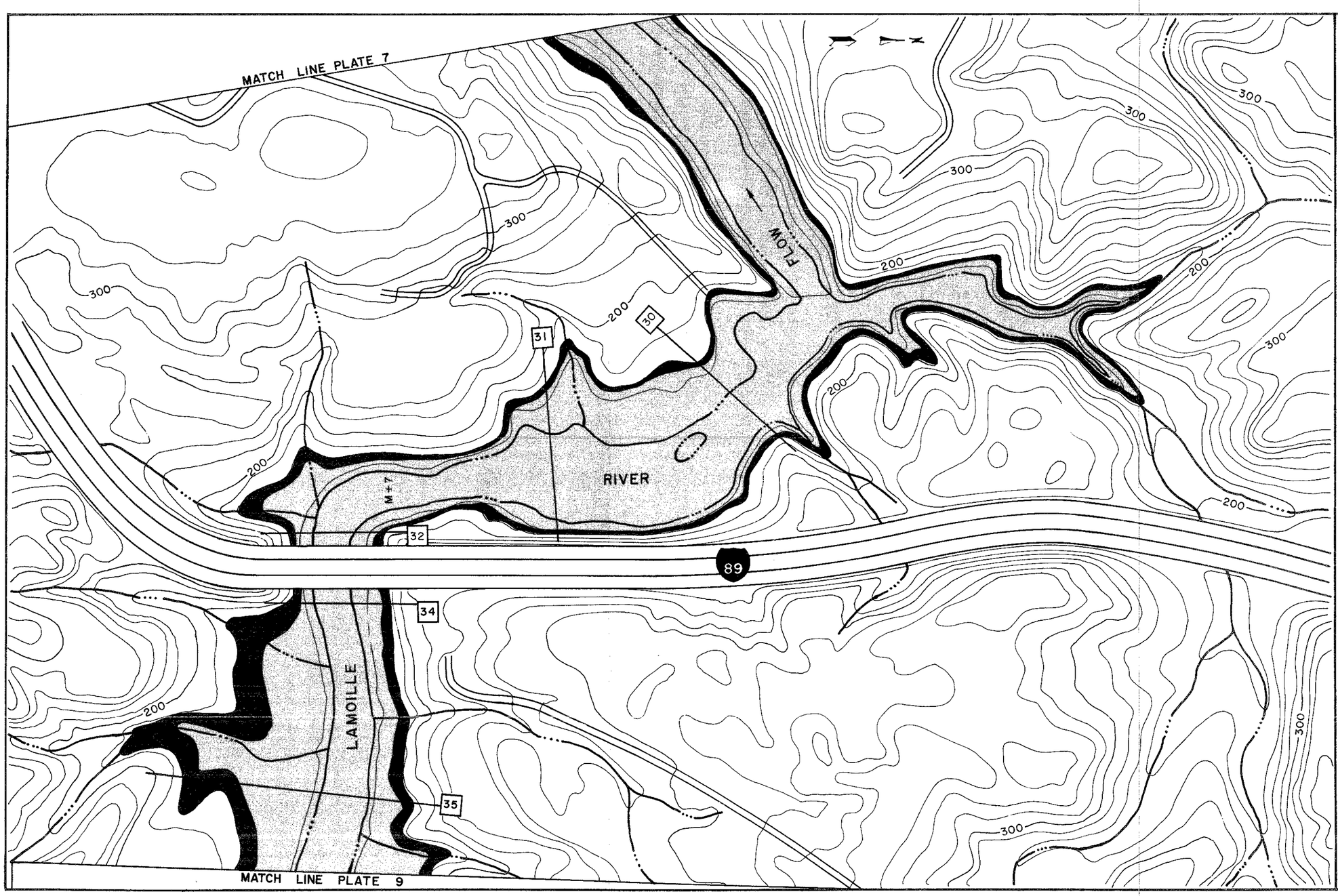
FLOOD PLAIN INFORMATION

TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

FLOODED AREAS

FEBRUARY 1976

PLATE 7



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD / 500 YEAR FLOOD

M + 2 — MILES ABOVE MOUTH

6 — CROSS SECTION

300 — GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL

CHANNEL

VILLAGE LIMITS

TOWN LIMITS

COUNTY LINE

U.S. ROUTE NUMBER

INTERSTATE HIGHWAY

NOTES

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SCALE IN FEET

0 500 1000

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NEW YORK, NEW YORK

FLOOD PLAIN INFORMATION

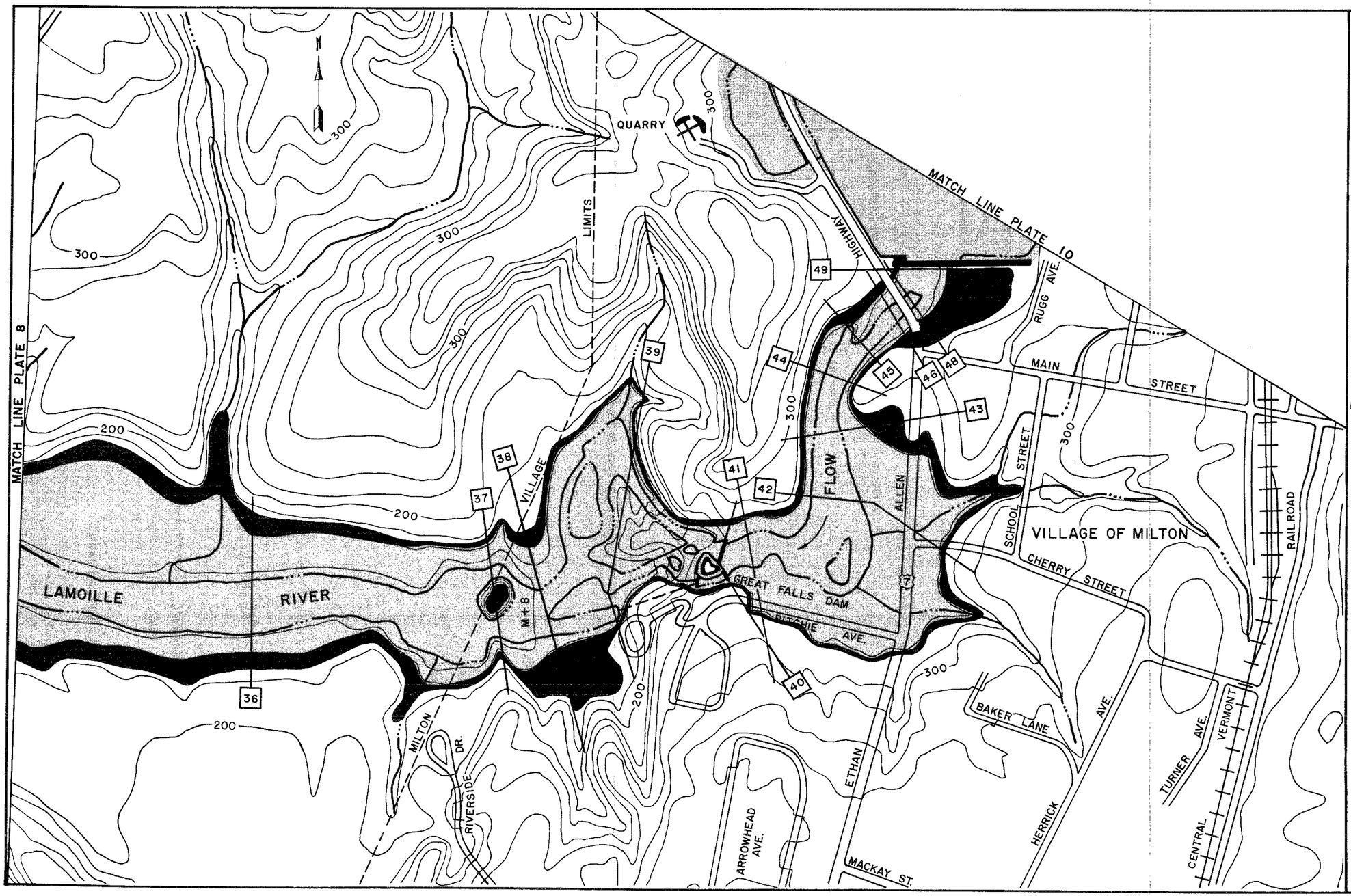
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON

VERMONT

FLOODED AREAS

FEBRUARY 1976

PLATE 8



LEGEND

OVERFLOW LIMITS

100 YEAR FLOOD / 500 YEAR FLOOD

M + 2 — MILES ABOVE MOUTH

6 — CROSS SECTION

300 — GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL

CHANNEL

VILLAGE LIMITS

TOWN LIMITS

COUNTY LINE

7 — U.S. ROUTE NUMBER

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SCALE IN FEET

0 500 1000

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NEW YORK, NEW YORK

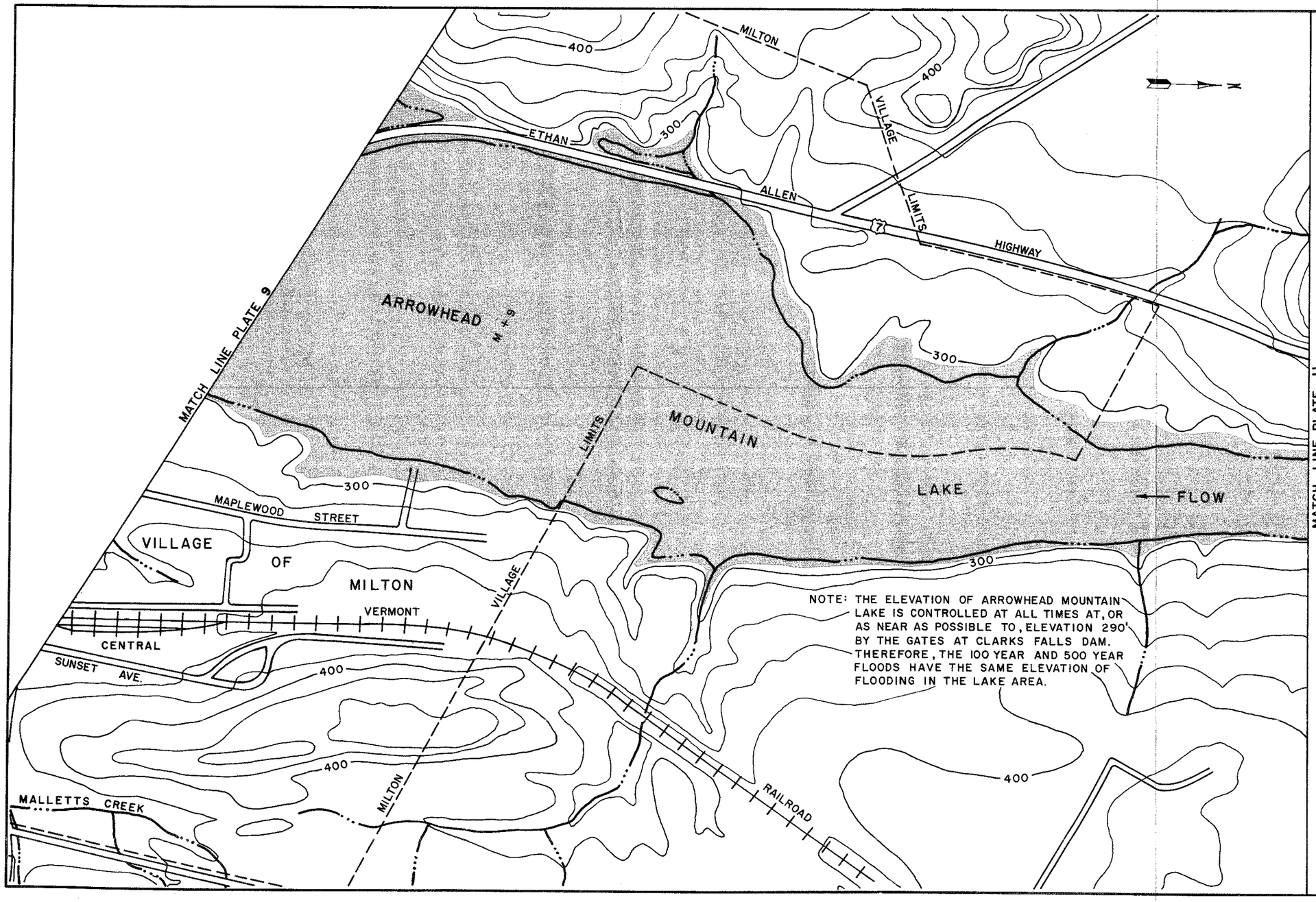
FLOOD PLAIN INFORMATION

TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

FLOODED AREAS

FEBRUARY 1976

PLATE 9



LEGEND

OVERFLOW LIMITS

- 100 YEAR FLOOD
- M + 2 — MILES ABOVE MOUTH
- 6 — CROSS SECTION
- —300— GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL
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- VILLAGE LIMITS
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- 7 — U.S. ROUTE NUMBER

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SCALE IN FEET

0 500 1000

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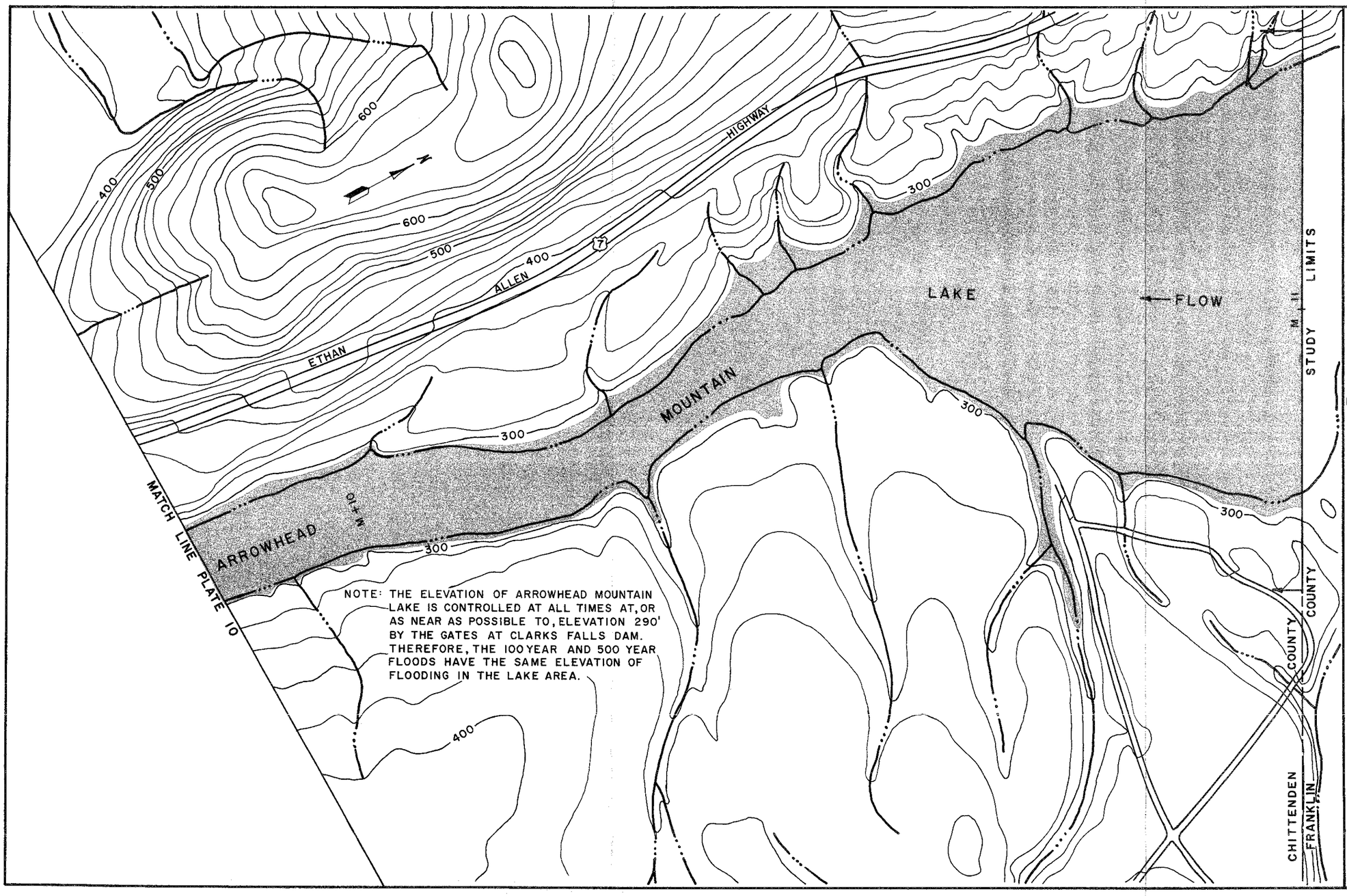
NEW YORK, NEW YORK

FLOOD PLAIN INFORMATION

TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

FLOODED AREAS

FEBRUARY 1976



LEGEND

OVERFLOW LIMITS

- 100 YEAR FLOOD
- M + 2 — MILES ABOVE MOUTH
- 6 — CROSS SECTION
- —300— GROUND ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- CHANNEL
- VILLAGE LIMITS
- TOWN LIMITS
- COUNTY LINE
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NOTES

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SCALE IN FEET

0 500 1000

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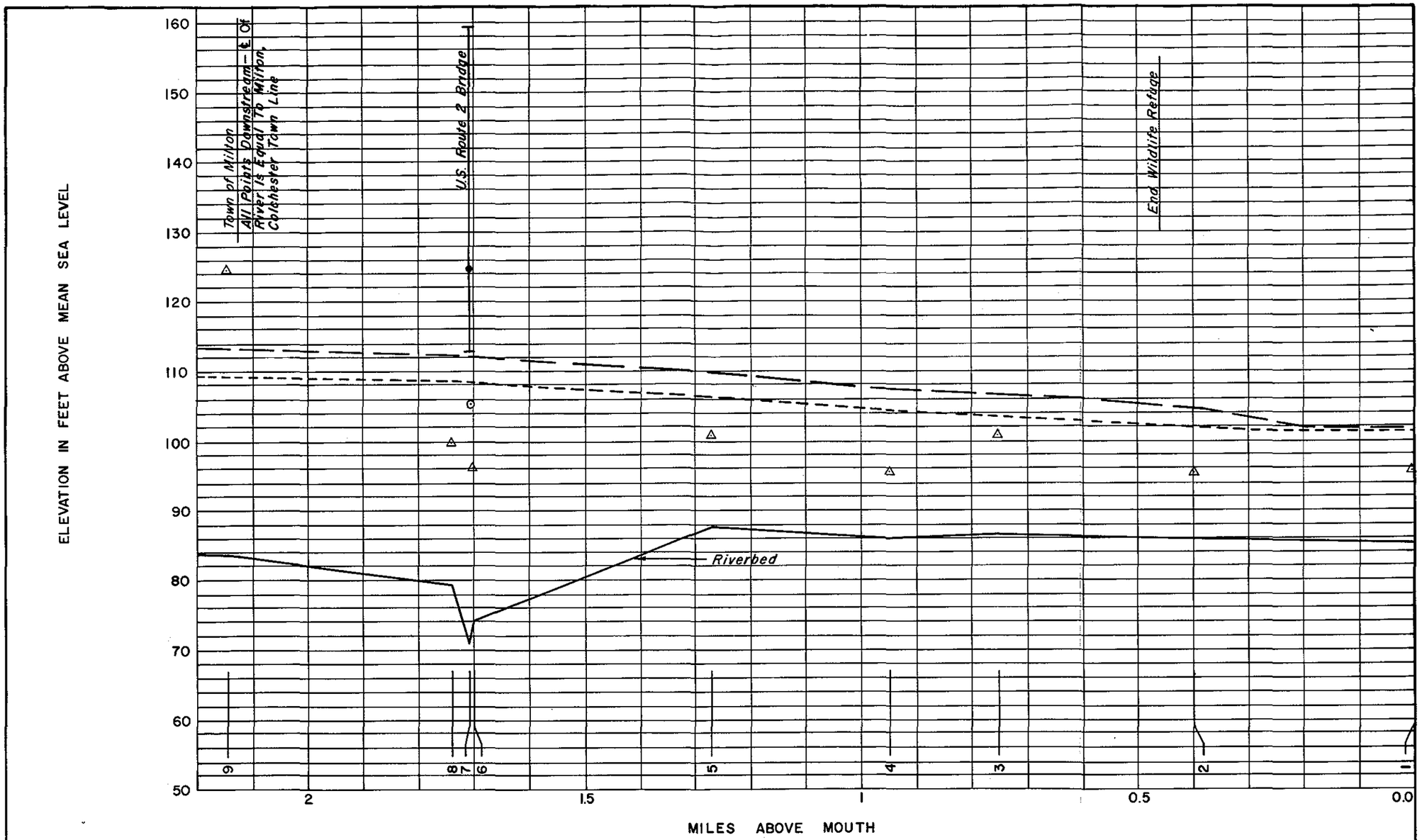
FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

FLOODED AREAS

FEBRUARY 1976

PLATE 11



LEGEND

- 500 Year Flood
- 100 Year Flood
- Top of Bridge Railing
- Bridge Floor
- Underclearance
- Top of Rail (Railroad Bridge)
- Top of Low Bank
- Dam
- High Water Mark November 1927

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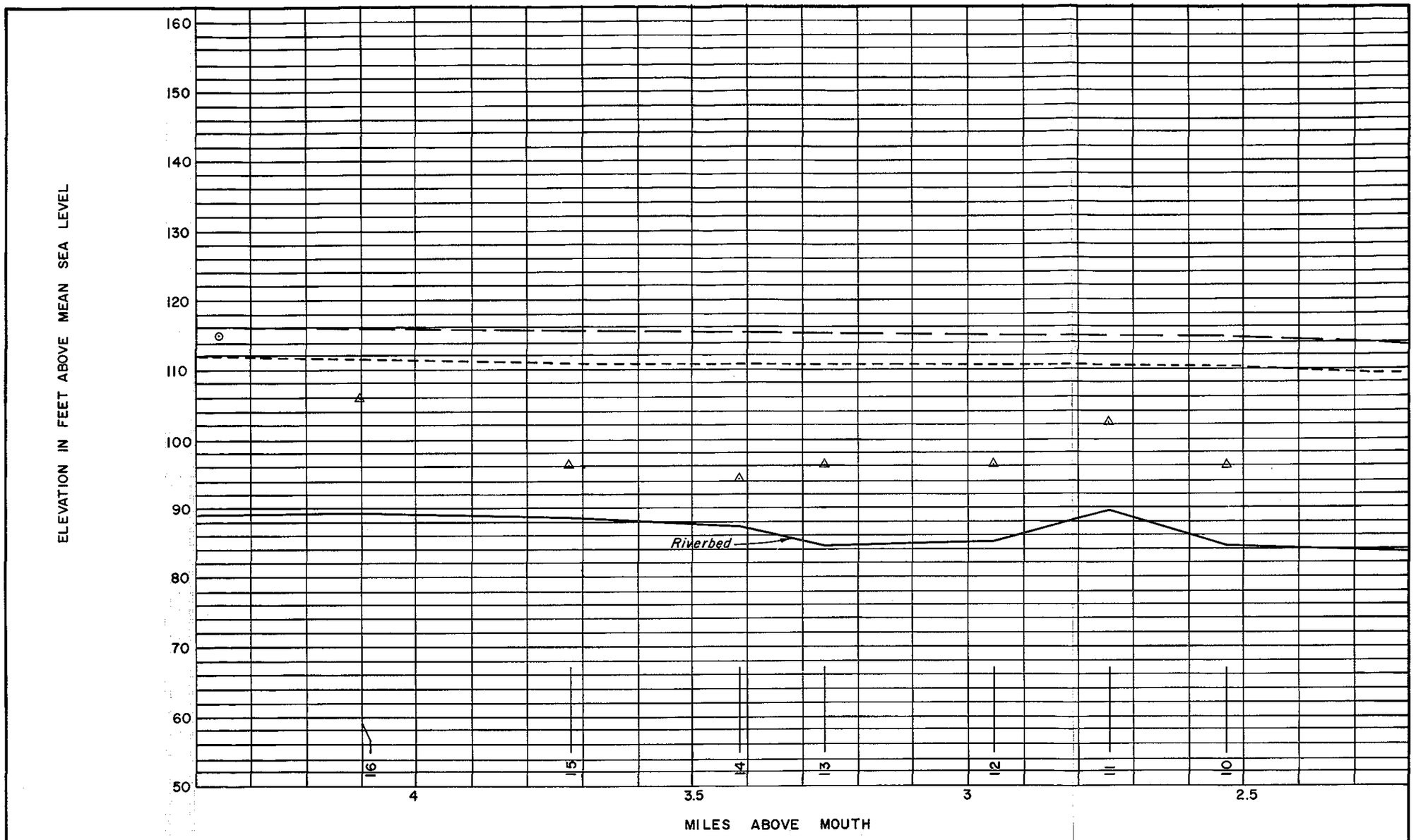
FLOOD PLAIN FORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
HIGH WATER PROFILES

LAMOILLE RIVER
FEBRUARY 1976

PLATE 12



LEGEND

- 500 Year Flood
- 100 Year Flood
- Top of Bridge Railing
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- Top of Low Bank
- Dam
- High Water Mark November 1927

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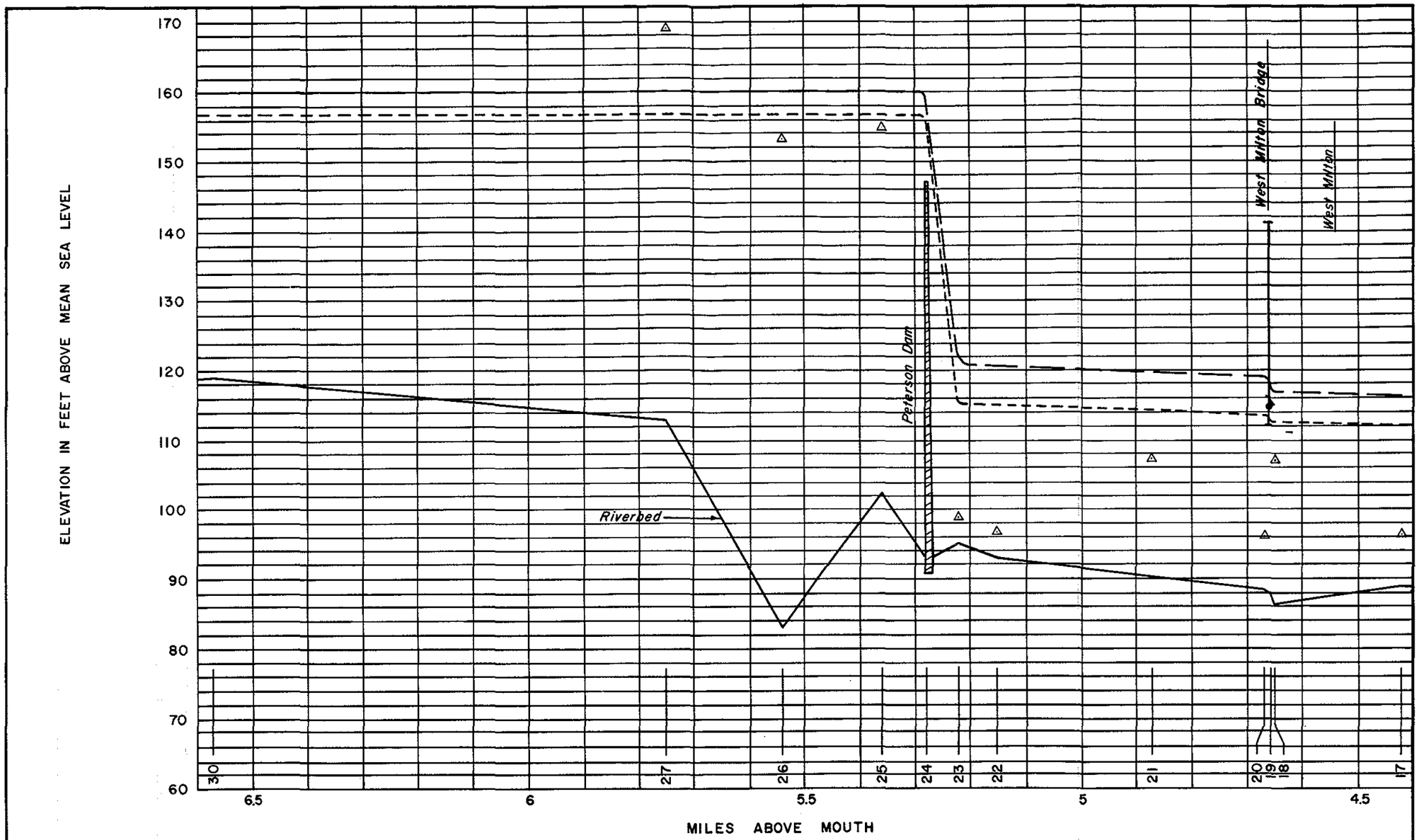
FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
HIGH WATER PROFILES

LAMOILLE RIVER
FEBRUARY 1976

PLATE 13



LEGEND

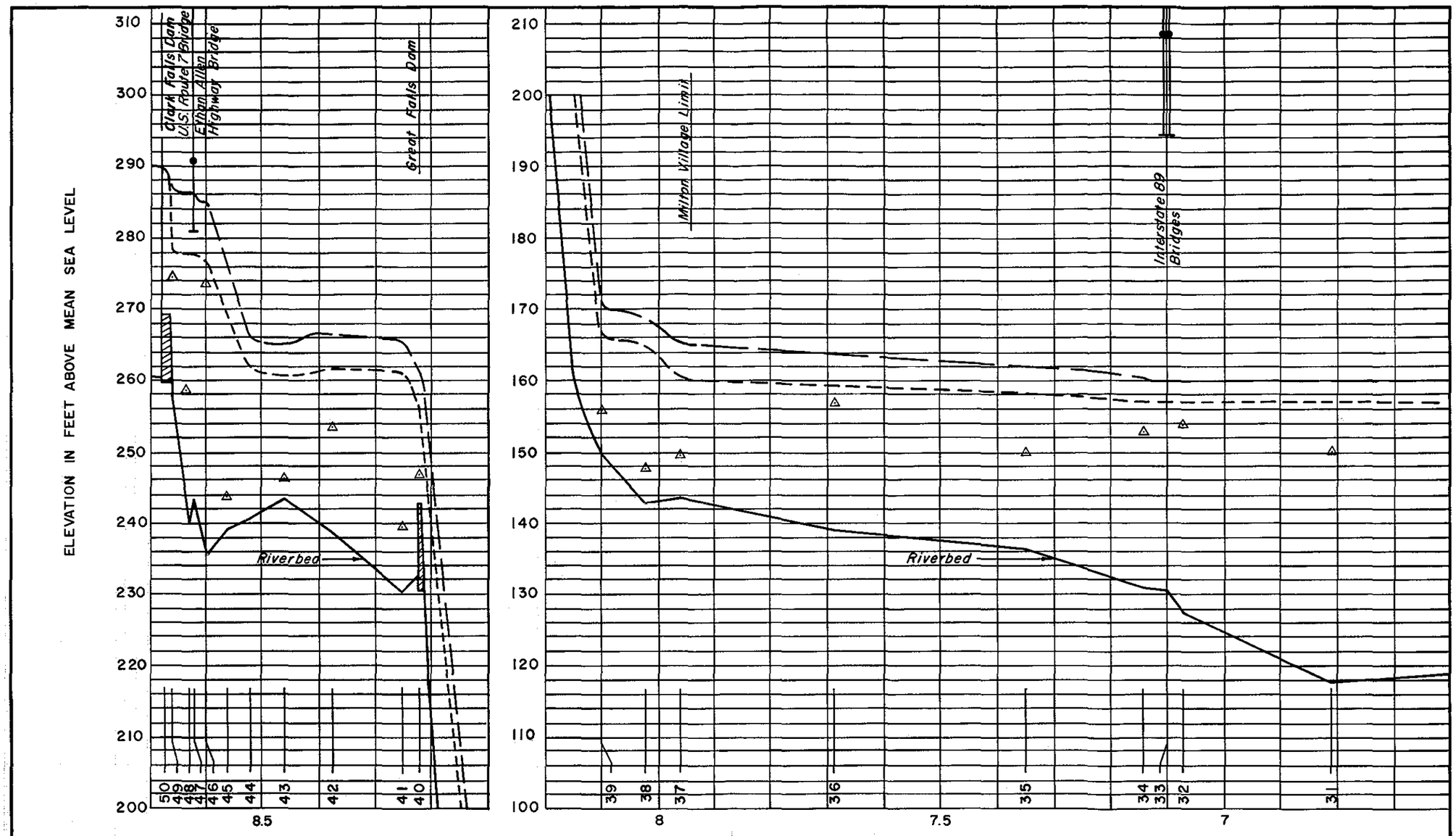
- 500 Year Flood
- 100 Year Flood
- Top of Bridge Railing
- Bridge Floor
- Underclearance
- Top of Rail (Railroad Bridge)
- Top of Low Bank
- Dam
- High Water Mark November 1927

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
NEW YORK, NEW YORK

FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
HIGH WATER PROFILES

LAMOILLE RIVER
FEBRUARY 1976

PLATE 14



LEGEND

- 500 Year Flood
- 100 Year Flood
- Top of Bridge Railing
- Bridge Floor
- Underclearance
- Top of Rail (Railroad Bridge)
- Top of Low Bank
- Dam
- High Water Mark November 1927

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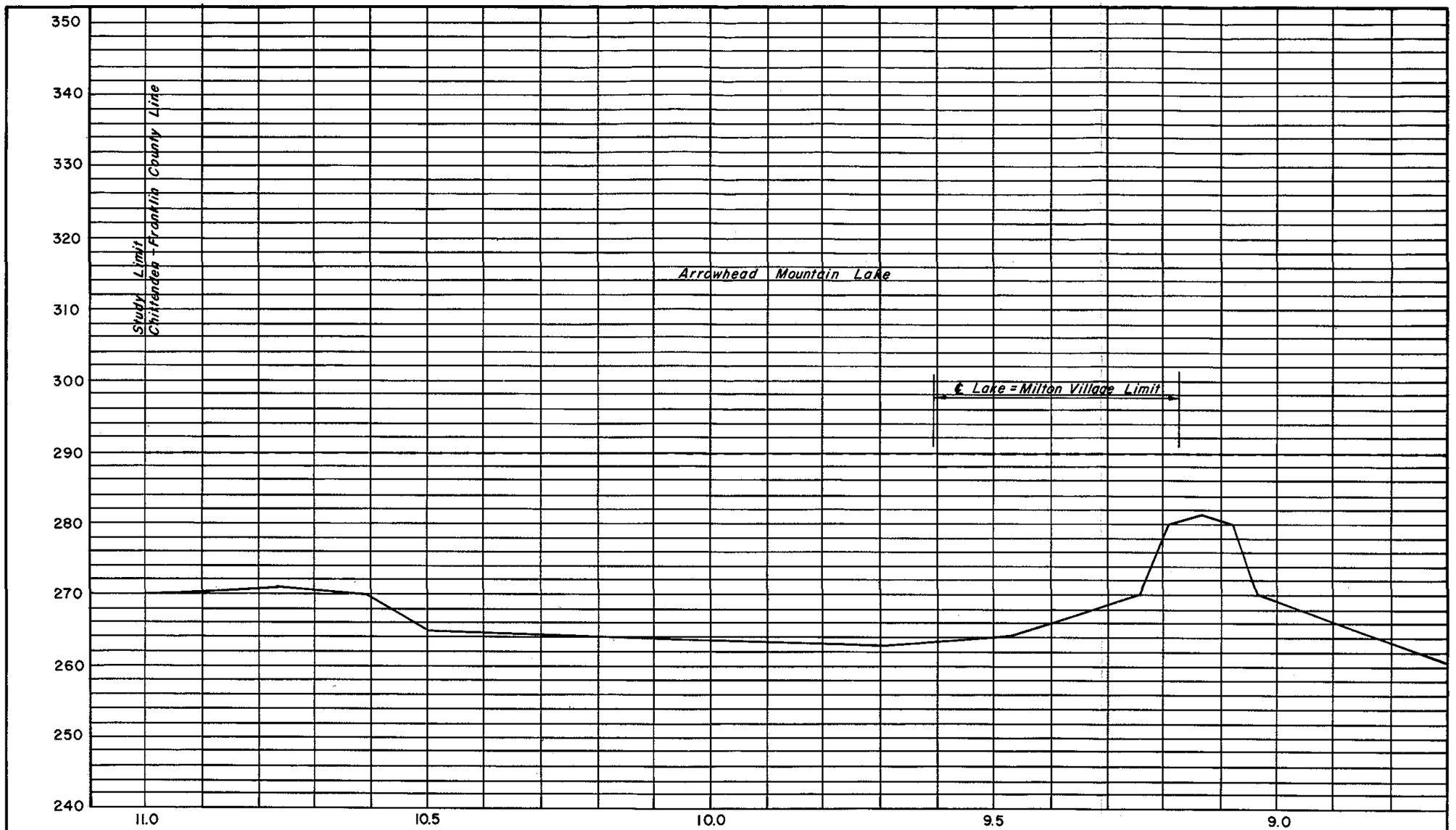
FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
HIGH WATER PROFILES
LAMOILLE RIVER
FEBRUARY 1976

PLATE 15



LEGEND

- 500 Year Flood
- 100 Year Food
- Top of Bridge Railing / Bridge Floor / Underclearance
- Top of Rail (Railroad Bridge)
- Top of Low Bank
- Dam
- High Water Mark November 1927

NOTE: THE ELEVATION OF ARROWHEAD MOUNTAIN LAKE IS CONTROLLED AT ALL TIMES AT, OR AS NEAR AS POSSIBLE TO, ELEVATION 290' BY THE GATES AT CLARKS FALLS DAM. THEREFORE, THE 100 YEAR AND 500 YEAR FLOODS HAVE THE SAME ELEVATION OF FLOODING IN THE LAKE AREA.

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FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
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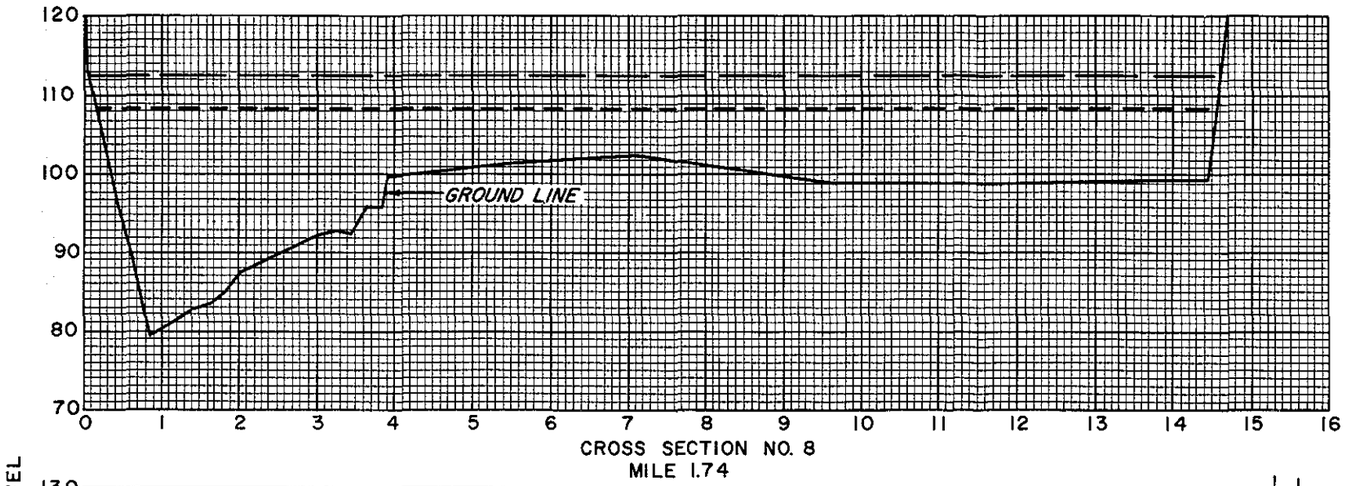
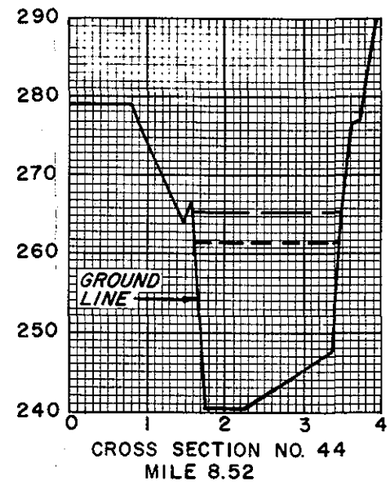
LAMOILLE RIVER
FEBRUARY 1976

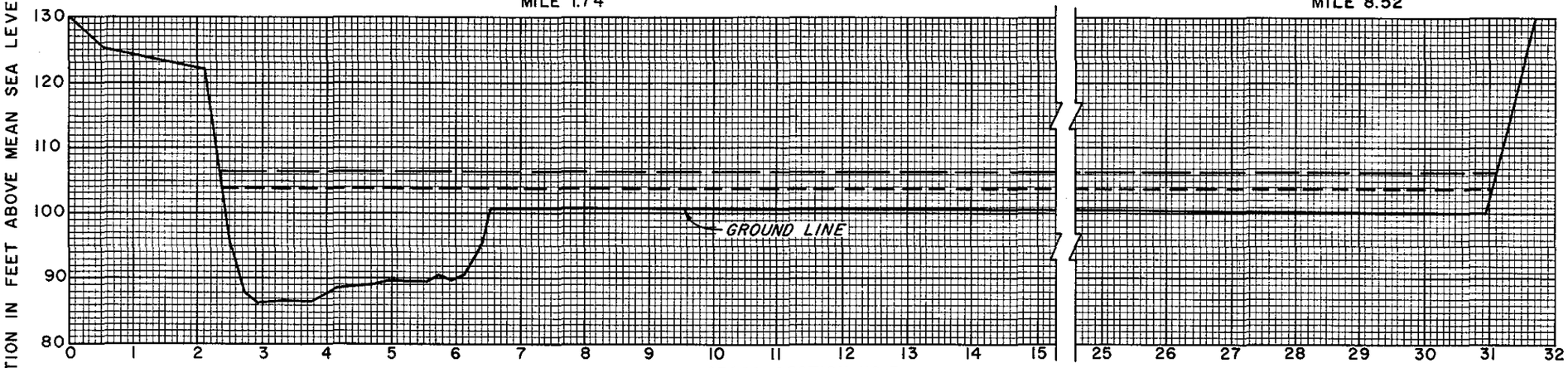
PLATE 16



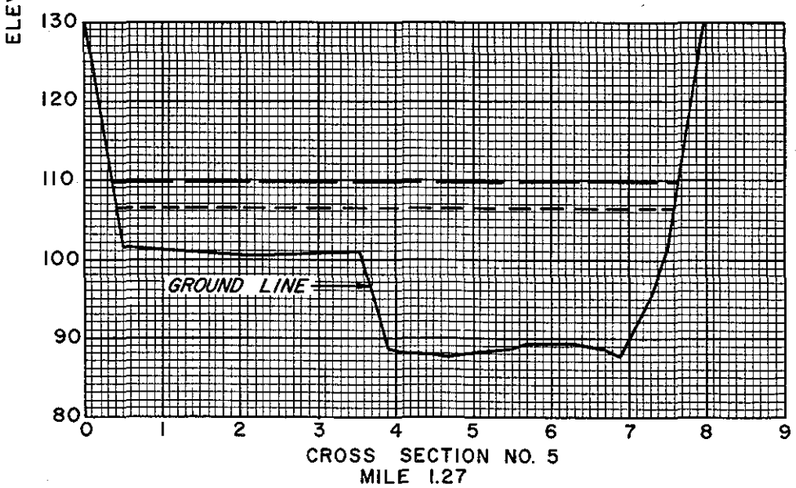
CROSS SECTION NO. 8
MILE 1.74



CROSS SECTION NO. 44
MILE 8.52



CROSS SECTION NO. 3
MILE 0.75



CROSS SECTION NO. 5
MILE 1.27

LEGEND

——— ——— 500 Year Flood

– – – – – – – 100 Year Flood

NOTES:

All other sections on the Lamoille River not shown in this report are on file at the New York District, Corps of Engineers and are available for inspection upon request. Sections taken looking downstream.

HORIZONTAL DISTANCE IN HUNDREDS OF FEET

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
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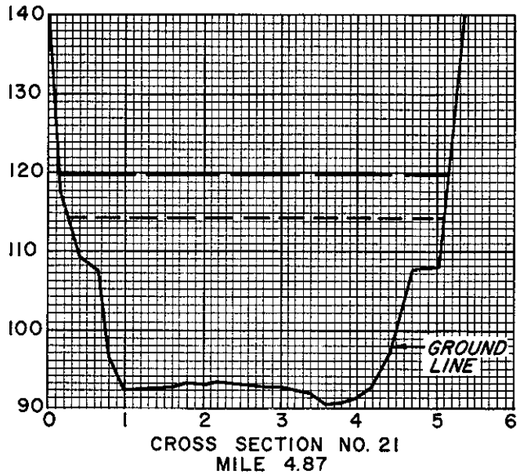
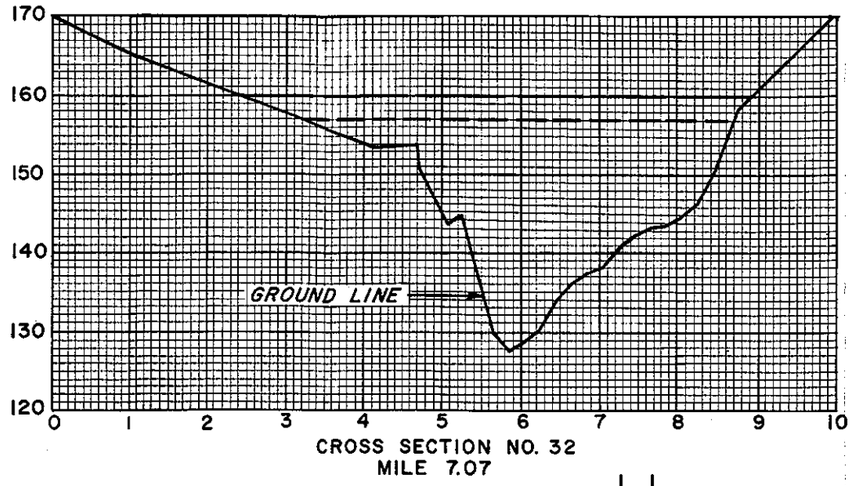
FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
SELECTED CROSS SECTIONS

LAMOILLE RIVER
FEBRUARY 1976

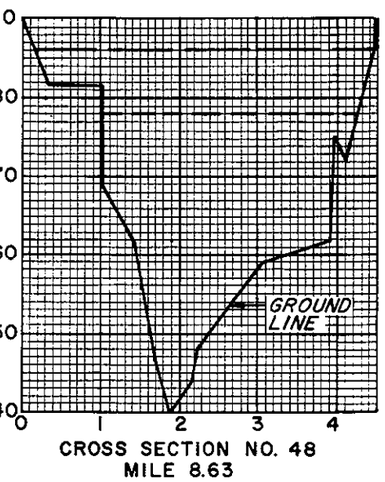
PLATE 17



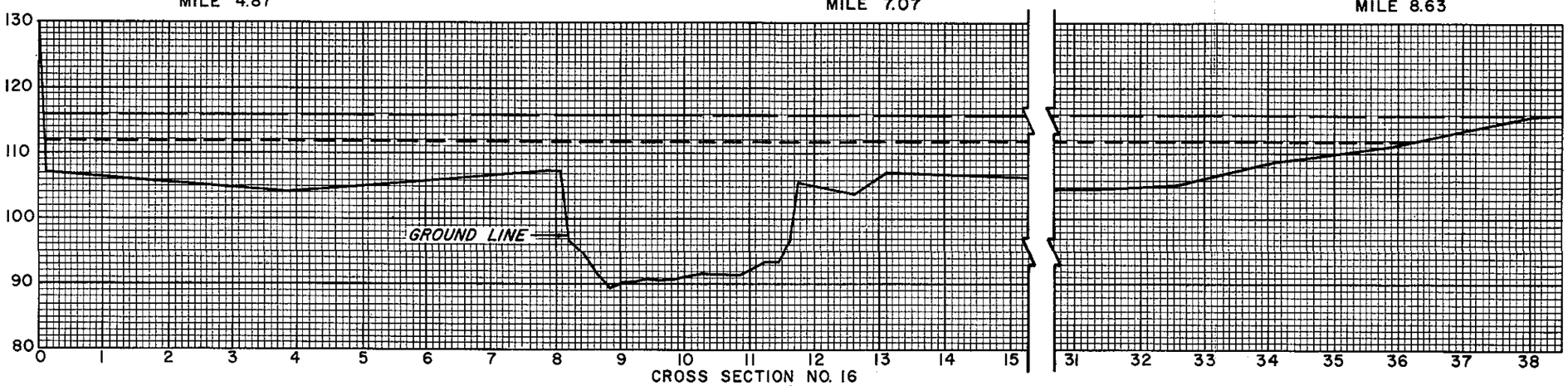
CROSS SECTION NO. 21
MILE 4.87



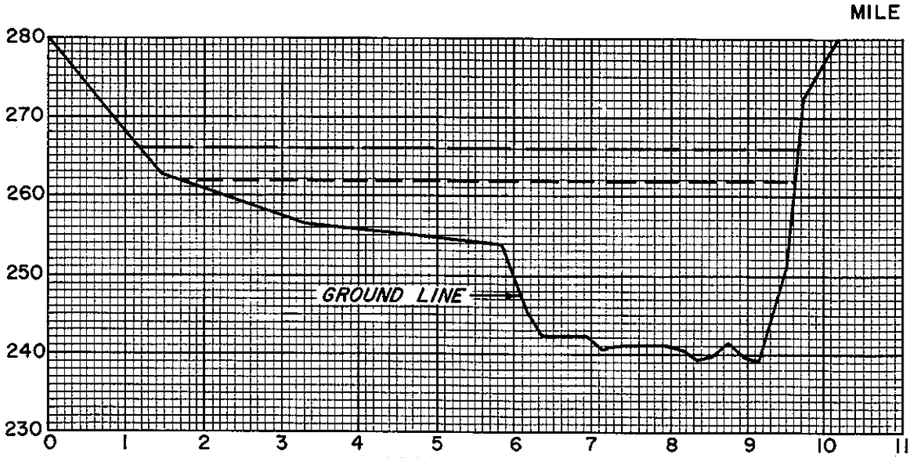
CROSS SECTION NO. 32
MILE 7.07



CROSS SECTION NO. 48
MILE 8.63



CROSS SECTION NO. 16
MILE 4.10



CROSS SECTION NO. 42
MILE 8.38

LEGEND

——— 500 Year Flood

– – – – – – – 100 Year Flood

NOTES:

All other sections on the Lamoille River not shown in this report are on file at the New York District, Corps of Engineers and are available for inspection upon request. Sections taken looking downstream.

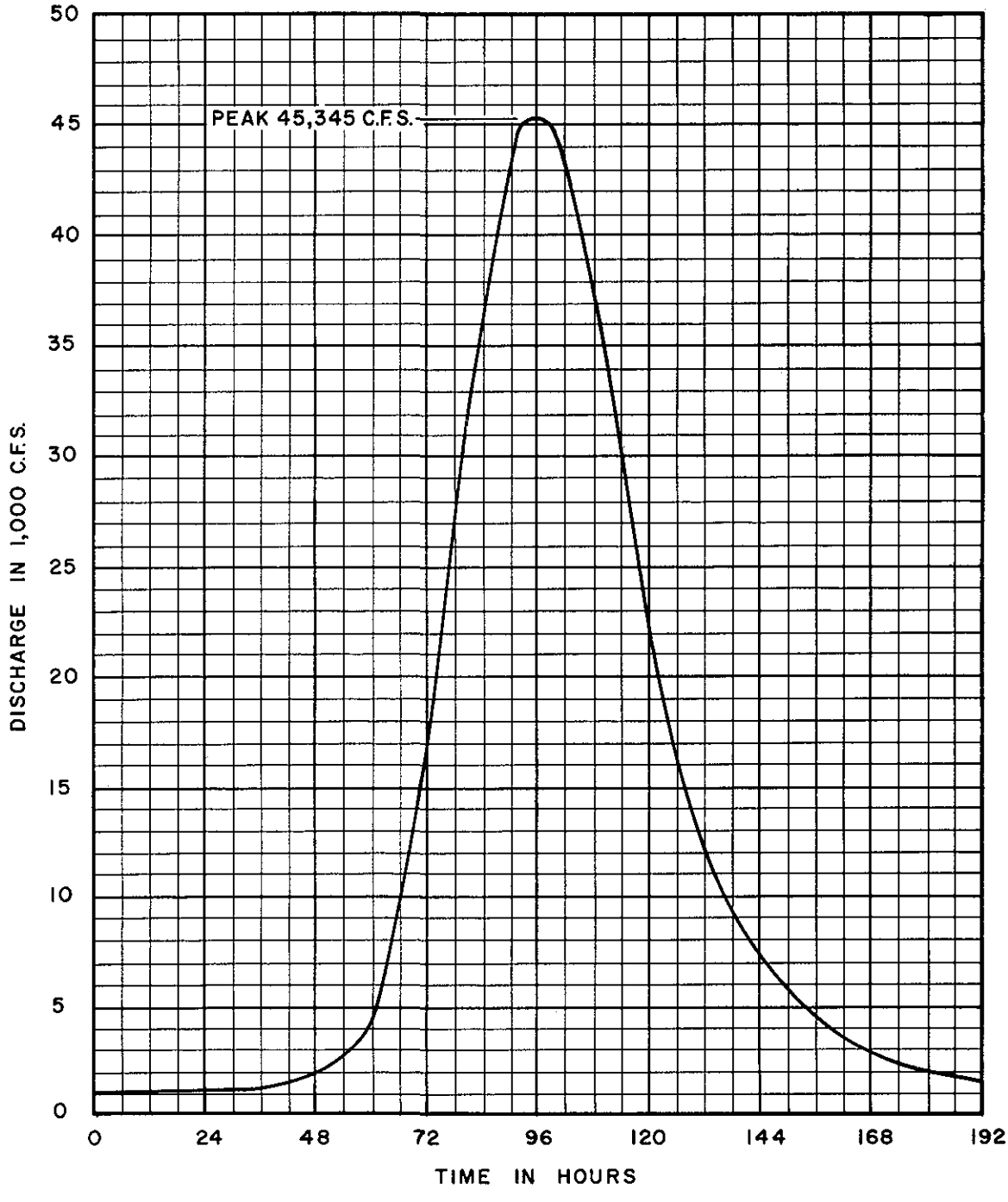
HORIZONTAL DISTANCE IN HUNDREDS OF FEET

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
NEW YORK, NEW YORK

FLOOD PLAIN IMFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
SELECTED CROSS SECTIONS

LAMOILLE RIVER
FEBRUARY 1976

PLATE 18



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NEW YORK DISTRICT, CORPS OF ENGINEERS
NEW YORK, NEW YORK

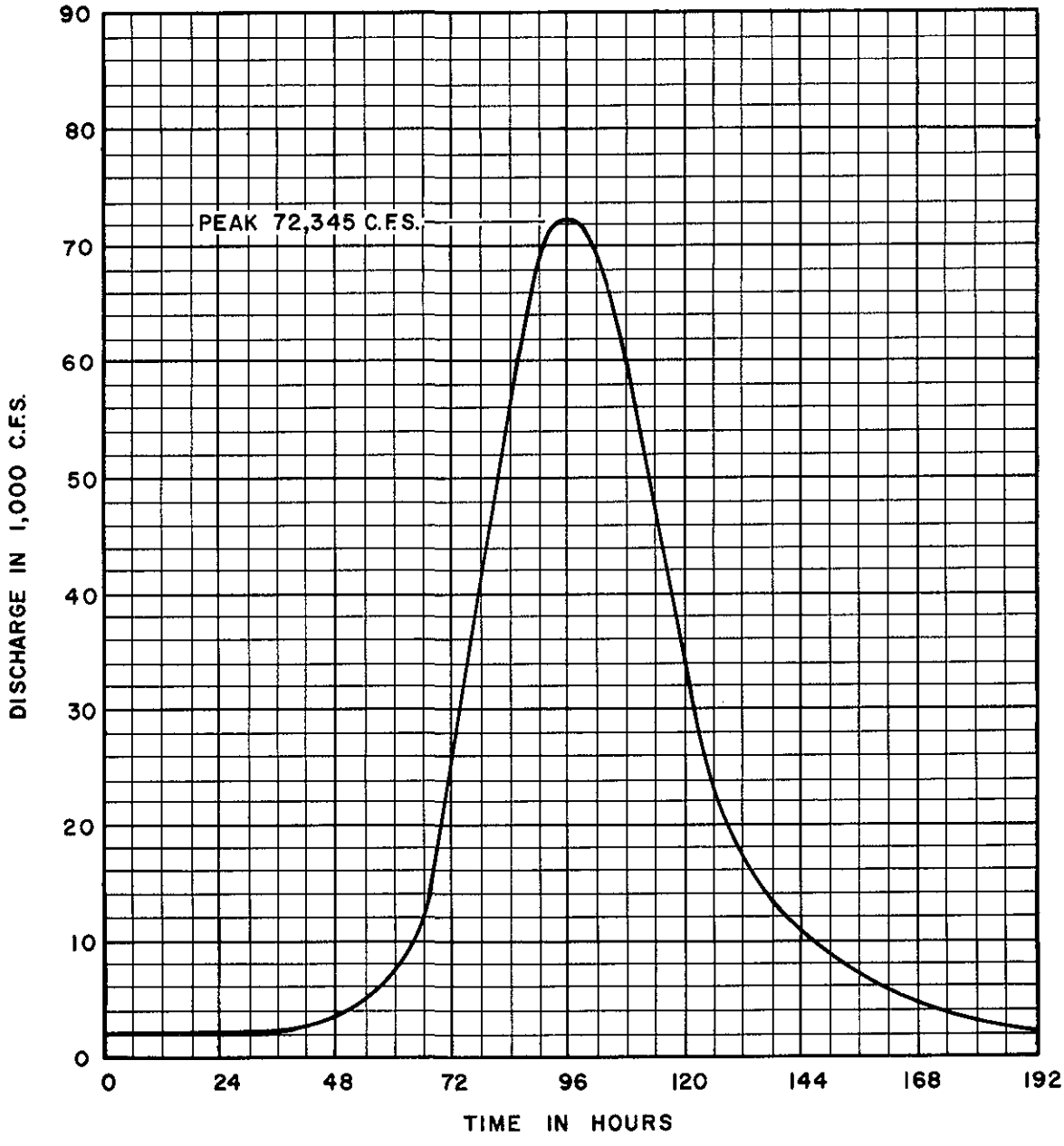
FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT

LAMOILLE RIVER
100 YEAR FLOOD HYDROGRAPH

FEBRUARY 1976

NOTE:
THIS HYDROGRAPH REPRESENTS THE DISCHARGES AT WEST MILTON, VERMONT.

PLATE 19



DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
NEW YORK, NEW YORK

FLOOD PLAIN INFORMATION
TOWNS OF COLCHESTER, MILTON AND VILLAGE OF MILTON
VERMONT
LAMOILLE RIVER
500 YEAR FLOOD HYDROGRAPH

FEBRUARY 1976

NOTE:
THIS HYDROGRAPH REPRESENTS THE DISCHARGES AT WEST MILTON, VERMONT.

PLATE 20